RAMBLES OF AN AUSTRALIAN NATURALIST

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RAMBLES OF AN AUSTRALIAN NATURALIST

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RAMBLES OF AN AUSTRALIAN NATURALIST

WRITTEN BY

PAUL FOUNTAIN

AUTHOR OF "ELEVEN EAGLETS OF THE WEST"

FROM THE NOTES AND JOURNALS OF

THOMAS WARD

BRADSHAW PUBLIC LIBRARIES

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PREFACE

It is always difficult to write a preface; it is an art to write a good one. There are peculiar difficulties in scoring the overture to the present work, because it is only partially mine. I am at liberty to say that it was because Mr Ward did not feel sufficiently confident to write the book by himself that he sought my aid. I hope I have done justice to the mass of splendid material he has entrusted to me. I can truly say I have handled it with a loving care that has not been exceeded in the writing of any of my own books. Before I undertook the task of collating Mr Ward's notes, I stipulated that I should be permitted to treat the book as my own. I regard it as a foster-child, but as dear to me as any of my own literary offspring.

Mr Ward is a Queensland stock-farmer, who, like myself, has amused himself in the intervals of a roughly laborious life with studying Nature in the wild, and prying into the wonders of her works. I am forbidden, by the position I have accepted, to say plainly what I think, or what I feel, of his ability as a field naturalist; but I must say that his splendid powers of observation demanded that I should exert myself to the utmost to deal worthily with the material placed at my disposal.

My task has been to reduce the notes to readable form, collect the scattered information on specific subjects, and identify and supply the scientific names of species, etc. I have corrected some obvious mistakes; but I have not

interfered with Mr Ward's facts or opinions, though some of the latter are in conflict with my own. I have maintained the first person in the narrative wherever it was possible to do so, and left Mr Ward to tell the story in his own language and style. In a word, I have confined myself to strictly necessary alterations and arrangements, feeling that the original narrative had a beauty and simplicity of its own which it would be a pity to spoil.

P. F.

March 1907.

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THE RAMBLES OF AN AUSTRALIAN NATURALIST

CHAPTER I

IN THE BLUE MOUNTAINS

THE Blue Mountains are plainly visible from my birthplace near Picton, New South Wales; and their deep azure outline is one of my earliest recollections. The remarkable intensity of colour, and the equally remarkable contour of these rocks, attracted my boyish curiosity when I must have been very young: and I made several attempts to get to them on foot long before I was old enough and strong enough to perform so long a journey.

In every country there are natural features which are fondly thought of by the people of the land; which are, as it were, the sylvan gods of the country; and the Blue Mountains are precious in the sight of every true Australian. One of his first enquiries of a stranger is almost sure to be if he has seen the Blue Mountains? And these fine rocks are worthy of the high place to which the Australian exalts them.

The Blue Mountains are now much frequented by seekers after picturesque scenery and holiday makers, and several railways afford facilities for reaching the most accessible portions of them; but during the days of my youth and early manhood, they were but very imperfectly known, even those parts which lie nearest to Sydney and other great centres of population, being only reached by a laborious journey, were seldom visited by any persons of refined and cultured mind—persons capable of giving an intelligent description of what they had seen.

Three young men, Blaxland, a squatter, Lawson, an

army subaltern, and Wentworth, in after years a leading Australian statesman, were the first to find a path over the Blue Mountains; but for several decades after their exploit the exploration of the range was left almost entirely to rough stockmen, whose chief, and perhaps sole, object was to find cattle-runs. One of the paths now most used, up which a prosperous railway winds its way, was discovered by a band of runaway convicts, who lurked in one of those singular valleys which are a striking feature of the mountains. Though they were traced to this valley, it was not until the police sought the help of aboriginal trackers that the entrance was discovered, and one of the largest of the now renowned exitless valleys was opened to the colonists. This, and other paths, have long since been improved; but formerly many of them could only be used at imminent risk of life or limb; and this is still the case with some remote and little-known passes.

One of the most difficult and dangerous that I have explored is about 40 miles north-west of Picton, and scarcely more than 12 south of the celebrated Penrith viaduct; but owing to the roundabout route that must be taken to reach it, it is difficult to estimate the distances. This pass, which seems to be nameless in the survey, cannot be reached from the east side of the mountains, and will probably not be opened up until the quarrymen are attracted thither: for it is impossible for cattle to reach it. It took myself and two companions, under the guidance of an old prospector, five days to reach this spot: and the journey may be described as a sixty-mile climb, the whole distance being a region of broken rock and rugged gully. Both the east and west sides of the mountain are here precipitous cliffs of great height, with a pretty level plateau at the top covered with forest. The valley beneath is a level plain, also covered with an unbroken forest of large gum trees, and bounded on all sides with walls of rock. These rocks project, like giant buttresses, into the valley, in many places forming headlands with deep recesses between them; but though the

valley is quite seven miles long by four or five broad, forming a large bay, there is no descent into it. In one place we found a ledge of rock about eighty feet below the top of the cliff, sloping downwards, which seemed to promise a pathway into the valley below, and one of our party insisted on being lowered by a rope. At great risk to his life, he succeeded in working his way down three or four hundred feet, but could get no further, and had to return without effecting his purpose. The height of the cliffs was variously estimated at from a thousand to sixteen hundred feet. The lowest estimate is possibly nearest the truth. About the precipitous nature of the rocky wall there could not be two opinions: for stones thrown down could be seen to drop sheer into the valley below.

We had provisions and water with us, the latter being carried in collapsible skin bags with bone nozzles. By the end of the fifth day, both food and water were exhausted: and I had my first experiences of the suffering and hardship of Australian travel. For three days we were almost entirely without food. Water we found; and our hunger we attempted to satisfy with berries and leaves, the reason, probably, that we all became very unwell, and reached Penrith in a state of great exhaustion.

On subsequent occasions I examined many others of these cliff-enclosed valleys; some larger and many smaller than the one just described. The character of all is similar. The cliffs are composed of sandstone of a light grey colour in the lower strata, and of a dingy light crimson in the upper. This band of reddish colour has a very remarkable appearance; and I could never discover the cause of it. It does not seem to be owing to the presence of iron in the strata; and it is characteristic of the rocks throughout the Blue Mountains.

In most countries the valleys have been formed by the erosion of water, and generally have a stream, large or small, flowing through them. That is not the case here. Some of the valleys have a small river or brook in them, but not of sufficient size or force of current to affect the form of the valley, and it is clear that there never has been

any great body of water in any of these remarkable recesses. In valleys which are from six to fifteen miles wide, I have found the strata of the opposite sides corresponding exactly, and of almost precisely the same height: while the bottoms of the valleys are level, or nearly level, plains, with occasionally a few scattered hills. There are no signs of water-wear, nor of the subsidence which Darwin thought might be a possible explanation of this unparalleled formation; and I think it is a pity that he did not devote more time and care to the examination of what he rightly recognised and described as a geological enigma; but which he unfortunately seems to have viewed with an impatience unusual in him.

Some of these enclosed valleys in the Blue Mountains have an area of more than a hundred square miles, with a depth of nearly two thousand feet, and yet have no opening through which the water of a small brook could escape. In a country with a fairly heavy annual rainfall these valleys would inevitably become deep lakes. Can they possibly be the beds of long extinct lakes, the waters of which have gradually soaked and evaporated away through some change of climatic conditions causing a cessation of the usual feeding supply? It is more likely that these valleys are the result of upheaval than of subsidence, and they may, at a remote period, have been saline lakes. Marine shells are very abundant in many places, but I have not found any other important remains that are likely to throw a light on the geological formation. Though many of the shells are of extinct species, a great number are identical with those still inhabiting the seas of the west and south coasts.

The vegetation of the valleys, if not rich, is abundant, and the forests are certainly valuable. Cattle thrive well in them, and they serve the purpose of immense parks from which it is impossible for the stock (as cattle in Australia are invariably called) to escape. The trees are no impediment to the grazing of cattle: for though the forest, viewed from above, appears to be dense, but few Australian forests have the density of tropical or European

forests; there is nearly always room to move freely about among the trees, and the best herbage often grows under arboreous shelter.

There is a certain amount of drainage into the valleys, but it is not sufficient to make any part of them marshy. Brooks are occasionally found, but the waters of these scantily-fed channels rarely find an outlet through the environing cliffs, and in the few instances in which they do, the passages are narrow and choked with masses of rock, and show no signs of extensive water erosion, a pretty certain indication that the valleys have never been the channels of large rivers. The valleys, indeed, have the appearance of enormous rents in the cliffs, often narrowing at each end into rifts so confined that even a dog cannot force a way through them, though the enclosing walls are perhaps three or four hundred feet in height. It may be positively asserted that these rifts do not owe their formation to water action. Water never runs through them in sufficient quantity, not even after heavy rains, to wash away any of the soil or rock, and they have probably existed for ages without modification of size or form.

Rills of water in many places run over the cliffs and fall, as pretty cascades, into the valleys beneath. Govett's Leap is one of the best known and most often referred to of these cascades, but none of them have a sufficient body of water to entitle them to be considered "falls." They are, nevertheless, much thought of by Australians, and many of them are the constant resort of holiday folks. Barriers, to prevent accidents, have been erected round the edges of the cliffs, and lordly hotels have been built for the accommodation of visitors—additions which are not always appreciated by lovers of unshorn Nature. The lover of Nature, however, need not despair if he is a man not averse to using his legs, and risking his neck, in an arduous climb. There are plenty of hidden spots, too difficult of access, and likely to remain so for many years, to be visited by any persons except those of a resolute and daring courage. There are spots in the mountains

within easy distance of Picton or Penrith, that are as quiet and little frequented as they must have been in the days of Captain Cook. That is, they are practically unknown. An occasional Government inspector, or wandering prospector, may have visited them, but the foot of the average traveller or sight-seer has never trod the rock in the localities I have in my mind. Here are some of the most delightful of the valleys, though the smallness of their area has led to their being overlooked, and here it is that the naturalist has the best opportunities of studying the animal life of the Blue Mountains, though that life is not very abundant in any part of the range that I have visited.

I have spent hours cautiously walking among the trees on the summit of the range, hoping to make discovery of some new bird or mammal, and heard no sound except the mournful murmuring of the breeze in the tree-tops. Birds there are, it is true, but they are not often seen in great numbers, and the habit the people of Sydney, and the smaller townships, have of going to the mountains to shoot parrots and wallaby—a habit that was formerly very generally indulged in—has tended to reduce greatly the number of Australian birds. Wallaby are only found among the rocks on the lower slopes of the mountains, and about their bases. If they ever existed in the valleys, they have long since been exterminated. They have become scarce everywhere on the coast side of the range, the result of continual persecution by gunners from the towns, and stockmen anxious to preserve every blade of grass for the use of the cattle. The valleys, too, are free from the rabbit pest—that prolific, feeble folk not having succeeded in passing the forbidding line of barrier cliffs. Flying foxes, or phalangers, and opossums are found in many places, but as these animals are mostly nocturnal in their habits, they are not often seen unless specially watched for, and there is nothing to be recorded of them in this place.

A few snakes of the genus *Dendrophis* are met with; and on two or three occasions I have seen diamond-snakes

at an elevation of at least three thousand feet above sea level. There are also a few lizards in the mountains; but none of these reptiles are sufficiently numerous to be characteristic of the region.

Probably the aborigines never frequented these mountains; and it seems certain that they never penetrated to the enclosed valleys. Even the rudest of wandering savages leave some records of their presence in a district; but I could never find the slightest trace of the former presence of the natives in these districts; and it seems more than probable that the range proved as impenetrable to the blacks as it so long did to the whites. Strange that large tracts of the earth should lie for thousands of years apparently useless to man and beast! Such, however, seems to have been the case in all the great divisions of the globe, so far as man and the larger animals are concerned.

Birds are the most attractive living objects in the Blue Mountains, and they are sadly few in number, and are daily becoming scarcer. Besides the parrots, whose destruction by holiday makers I have mentioned, the lyre-bird, one of the most characteristic birds of our continent, has been cruelly persecuted, so that it has not only been exterminated in many districts, but is now scarce everywhere, and in danger of total extinction. The Blue Mountains are, or were, the headquarters of this very remarkable bird, and of one or two others which must always be objects of deep interest to the true naturalist. I think these birds are worthy of a chapter to themselves; and, accordingly, the next division of this little work is devoted to a description of what I have succeeded in learning about their ways and habits.

CHAPTER II

SOME OF THE BIRDS OF THE BLUE MOUNTAINS

My first shot was fired at a parrot when I was a boy of some twelve years. Well do I remember with what trepidation I aimed the gun, in spite of the assurance of older marksmen that it was an easy one to fire and would not "kick," and what joy rushed to my young heart when I saw the bird flutter, mortally hurt, to the ground.

Parrot-shooting is a favourite sport in Australia, and takes the place of rook-shooting in England. It was, I think, a more prevalent pastime in my youthful days than at present. Parrots were then more abundant than they are now; and on public holidays, especially at Christmas time, people went out of the towns by hundreds, often for a week at a time, to shoot parrots. Parrot-pie is as much esteemed in Australia as rook-pie in England; and if the birds are young, is quite as palatable. But an old parrot is one of the toughest birds that fly, and one of the hardest to kill. A parrot will carry away more shot than any other moderate-sized Australian bird, and must be very hard hit before it will drop. Perhaps this is the reason that it is considered to give such good sport to the fowler.

The Psittacidæ, the Columbæ, and the Anseres are three of the most characteristic orders of Australian birds, and are all well represented in New South Wales.

The parrots are usually associated with decidedly tropical scenery and climate; but though Australia is the headquarters of several well-marked groups, or families, of the order, they are largely met with in descriptions of country that can scarcely be called tropical, or even

sub-tropical. With very few exceptions Australian parrots and cockatoos frequent only the wooded portions of the land: although they are found, the cockatoos especially, along the courses of rivers which have a fringe of wood on their banks, though that fringe, in the west and north, is often very thin.

The first shot referred to above was at a Blue Mountain parrot, a species formerly very common in the vicinity of Sydney; and I have even seen it on trees in the suburbs of that city. It is the Swainson's loriquet, *Trichoglossus novæ hollandiæ*, of naturalists; but though often called a lory, I never heard it described locally by its true name. It is still tolerably abundant in the interior parts of the colony; and its beautiful plumage does not save it from being shot for the table. It is a honey-sucker, and for that reason many persons think that its flesh is superior in flavour to that of other parrots.

The crop of this bird is nearly always full of a sort of nectar which it extracts with its tongue from the sweet blossoms of the native honeysuckle; and probably from many other flowers; but it is a mistake to suppose, as many naturalists seem to do, that it does not consume more solid food; for I have seen it eating many different kinds of bush fruits. It also often eats the flowers of the honeysuckle bodily; and frequents the gardens of the western settlers for the plums and cherries which they delight to cultivate.

Many of the habits of Swainson's loriquet greatly resemble those of pigeons. For instance: they go in pairs, and these pairs frequently join with others to form small flocks of ten or a dozen couples; and on occasions, which seem to be dependent on a peculiar state of the weather, they collect in large flocks of one or two thousand. All these habits may be noticed in tree-frequenting species of pigeons. The loriquet, as well as some other parrots, flies much like a pigeon; and when perched on a branch has several similar little tricks of movement. A sudden change of temperature will cause them to assemble in large flocks. They then wheel round in the air, perhaps

many times, gradually mounting higher, and screaming almost as noisily as cockatoos, and finally fly off rapidly in a compact body. I suppose that they go in a pre-arranged direction, and that the object is to seek a warmer district. The whole attitude and manœuvring of the birds seem to indicate that this is their purpose; but how far they go, or to what description of country I have not been able to discover. They are capable of enduring a considerable degree of cold, and are often found at a great height in the mountains of all parts of New South Wales. I have several times seen flocks of them flying about in snow storms. They have, however, a great dislike to rain, and in wet weather hide away in hollow trees and under the broad leaves of palms and other plants. They breed in hollow trees, like the majority of parrots, but I watched one pair which reared their brood in a hole excavated with remarkable expedition in the bulky stem of a grass-tree not six feet from the ground. The eggs are usually two or four in number, and the few pairs of young birds which I have taken and reared were always couples—a cock and a hen. The old birds are very attentive to the young, and affectionate among themselves; and the young are fed with the syrup, or honey, which the old birds eject from their crops for the purpose. This syrup is, I suppose, partially digested, a circumstance which may account for the difficulty which is experienced in rearing the young birds on artificial syrup or bee's honey, but they will thrive on soft, pulpy fruit.

Swainson's loriquet is a very noisy bird. It seldom takes flight without uttering loud screams, which might easily be mistaken for those of a cockatoo. It has also a peculiar wheedling note, used when caressing its mate, and which in captivity is often uttered when it is dreaming; but it is not a good talker. It is often claimed by colonists that parrots of this species can be taught to utter amusing remarks; but the sounds never seemed to me to be given very clearly. Its beautiful plumage and lively habits are its chief claims to interest as a pet. It is not remarkable for intelligence, and scarcely seems to recognise its owner.

Intelligence, I think, is always less marked in birds than it is in the higher class of vertebrates; but there seem to be some noticeable exceptions, which may be described further on in these pages.

This loriquet is found on all parts of the east side of Australia, especially on the Blue Mountains, and the hills which form continuations of that range north and south. I have not seen it in the interior, west of these mountains; but the large flocks mentioned above would sometimes, after much wheeling around and ascending to a great height, fly rapidly in the direction of the centre of the continent.

As many persons believe that snow is almost unknown in Australia, I may mention that falls of snow are of tolerably common occurrence in many parts of the Blue Mountains, though it never lies long on the ground. These snow storms seem to be more numerous periodically—at intervals of seven or eight years.

By far the most curious and interesting bird found in the Blue Mountains is the lyre-bird, of which two species are to be found on that part of the range which is nearest to Picton—the *Menura superba* and the *M. alberti*. There is a third species found in the colony, but my remarks concern the *M. superba* only. The other two species are scarce, and all three are naturally, or have become through incessant persecution, extremely shy.

The lyre-bird is essentially a mountain-forest bird, and is solitary in its habits. It never assembles in flocks or parties, and in all my experience I have never seen more than a pair, or a pair and a young one, together; generally solitary birds only are met with. Possibly the hen is never far away from the male bird, for they pair for life. But except at the breeding season they are not often seen actually together.

A general description of the bird's plumage is scarcely necessary; but in one particular all descriptions that I have read quite fail. And that is the peculiar *tone*, so to speak, of the bird's appearance. Were one of these birds produced with the assertion that it was an *old-world* species

one could almost believe it. It certainly has an old-time, extinct, antediluvian appearance—the characteristic appearance, indeed, of several Australian birds and animals. The plumage is usually described as brown with reddish markings on the tail feathers, and grey under parts; but in life, at anyrate, the tail coverts, most of the tail feathers, and the under parts, have a peculiar *dust* colour that I have not seen in any other bird, living or dead. This peculiar tone, combined with the remarkable form of the lyre-bird, gives it a unique appearance that is not exceeded by that of any other avian curiosity. It seems, in very fact, to be the strange inhabitant of an undeveloped, newly created land. That, at least, is the impression that it has always given to my mind.

The Blue Mountain range is, as I have said, the stronghold of the lyre-bird. There it can be seen and watched as it certainly cannot be in any other part of the country. It is there now more abundant than in any other district, though it might, perhaps, be more correct to say that this is the only part of the country where it is not practically exterminated. For a long time a good price was obtainable at Sydney for its feathers, and if a bird was ever seen within a hundred miles of that city it was tracked down and shot. Never numerous, it is now only found with difficulty in most parts of the colony. There are a few spots, however, in the mountains where it has not been disturbed, especially the isolated valleys which were described in the first chapter.

It has always been considered, by systematists, a puzzling bird, and has been allotted to at least half a dozen genera. Some thought it a thrush, others a wren. For a time it was a crow; and when first discovered it was described as a gallinacious bird; while the French naturalist Vieillot called it "Parkinson's Bird of Paradise," a description which was accepted by an English ornithologist of some note. It is now usually placed among the Passeres, or perching-birds. In any case the lyre-birds are an aberrant family. Avian classification presents great difficulties; and the order Passeres (or perching-birds) as at

present laid down is simply an ornithological *receiving-ship* where avain nondescripts are sent until they can be allotted to their proper stations. The Passeres form the bulk of the birds, and the order is a convenient one in which to place a bird that cannot be satisfactorily established in any other; but I strongly doubt that it is a passere. On the other hand, so many Australian types of animals, of nearly all classes, are so manifestly aberrant that it behoves one to be chary of expressing an opinion.

Superficially the bird resembles some types of Indian pheasants, both in size and appearance. It is also like a crow, but it does not at all resemble a wren or a thrush. Judging, as he did, from a drawing only, Vieillot was justified in thinking it a bird of paradise, especially considering the region from which it was reported. The birds of paradise are, in my opinion, closely allied to the crows, but crow-like as is the lyre-bird, its plumage is not at all like that of the hard, glossy *corvidæ*, but is very full, and beautifully soft and fleecy to the touch. The hen has not the remarkable lyre-shaped tail which distinguishes the cock, but her tail is full and plume-like. The cock has also a crest of filamentous feathers. The legs and feet are adapted to swift running on the ground; but though they can run very rapidly, they are sometimes caught by dogs. It is not a strong flyer, but rises without difficulty and flies much like a weak-winged crow. It soon drops, always choosing for the place of alighting a patch of dense scrub, in which it runs to some secure lurking-place, so that I have rarely succeeded in flushing one a second time. I have read of their ascending to the tops of tall trees, but have never seen such a thing. They sometimes perch on low branches a few feet above the ground, apparently for the purpose of surveying the ground, but never fly very high, and at the least sound they instantly drop to the ground, and run to shelter at full speed, uttering, two or three times, a single note of fright or warning. The lyre-bird is one of the most timid and cautious birds found on the Australian continent. Yet it is a pugnacious bird, and two cocks will sometimes fight fiercely, the source

of jealousy being hard to discover. It does not seem to be for possession of the hen, but rather arises, I think, from a natural quarrelsomeness of disposition.

The food is, I think, entirely animal, and consists of all kinds of insects, grubs, and slugs. I have seen them probing decayed wood and bark in search of large grubs, three or four inches long and as thick as the little finger, which they eagerly devoured. If insects fly near them they will leap up in the endeavour to capture them, in which they often succeed; and they search the crevices of rocks and tree trunks for the minute creatures that lurk in such hiding-places. Ants, also, often afford them a good meal; and they scratch the ground like domestic fowls in their search for some undiscoverable dainty of microscopic size.

The tail of the cock, seldom less than twenty inches long, is usually carried trailing on the ground behind him, for, like the peacock, he only occasionally displays this handsome appendage. At the breeding season he makes frequent displays of it for the edification of his hen; at other seasons it is rarely elevated. The hen, whatever her real sentiments are, does not reveal that she is much charmed by this show, but will be industriously scratching and searching the earth while her mate is strutting round her continually uttering an indescribable sound unlike that of any other bird, and so harsh that a person hearing it for the first time would be surprised to learn that it issued from the throat of a bird that has been justly described as "a sweet songster."

Song-birds, properly so described, are usually small in size: the lyre-bird is one of the largest—perhaps absolutely the largest. It is seldom that a bird as large in the body as a bantam-cock is heard piping sweetly, yet the song of the lyre-bird is as pleasing to the Australian as is that of the nightingale to the Briton, and, as all who hear it readily admit, reasonably so. Not only is the lyre-bird the most charming-voiced of Austral birds, it is also the mocking-bird of New South Wales. As is well known, it imitates the notes and songs of other birds, but I have not

found the fact recorded that it also reproduces many other than bird sounds, the two most extraordinary of which are perhaps a hissing noise similar to that uttered by an alarmed snake, and a sharp knocking sound like that produced by striking a tree-trunk with a stick. All these sounds are uttered apparently for the bird's own amusement. The song is rather loud, but sweet and flute-like in tone, and quite unlike that of any other bird. It is piped forth while the bird is perched on a branch, or dry stick, close to the ground, and sometimes when it is on the lowest bough of a tree not more than five or six feet from the ground. The sounds of imitation include the calls and cries of every creature that is found in the localities which the lyre-bird inhabits, including those of such noisy birds as the eagle, and the laughing-jackass, neither of which are numerous in the Blue Mountains, though both are widely spread. The lyre-bird nearly always interposes snatches of its own song between its mimic cries, and finishes its concert with a prolonged solo of its own notes. The times of singing are sometimes early morning, but more often in the evening; and the song is often kept up till night has quite set in.

The nest of the lyre-bird more resembles a house than a nest. It is a large enclosed structure, generally placed against a gnarled tree-trunk, or amongst the tangled roots of a partially up-rooted tree; but it is so constructed, and so skilfully placed that it is almost sure to escape the notice of a careless searcher. It looks like a mass of tangled root-fibres and briers half-buried amidst dead vegetation. The entrance is always well-concealed, and the egg cannot be got at without breaking up the nest. The opening is at the base of the nest, level with the ground, and the bird ascends upwards to a kind of platform beyond which there is a depression for the reception of the egg. Only one egg is laid each season, and that egg is as curious and aberrant as the bird itself. It is usual, in all parts of the world, for the eggs of birds that breed in the dark (and the interior of the nest of a lyre-bird is darker than the interior of a hollow tree-trunk) to be pure white,

but the egg of the lyre-bird is *black*, or so nearly black that it cannot be described by any other word. It has a peculiar smudged appearance ; but the eggs vary a little, some being darker and clearer than others. All are black, however, and large in size compared with the bird.

I have thought from the time I first examined a lyre-bird's nest that its peculiar shape is intended as a defence against snakes and lizards. These reptiles could not possibly get at the young without exposing themselves to an unguardable attack from the hen bird, and the nest is probably highly protective in appearance. Before I gained experience I could never discover a lyre-bird's nest until I almost kicked against it. The time of nesting is, in New South Wales, from April to July. I have taken eggs as early as the middle of April, and unfledged birds may be found in July. All attempts which I have made to rear the young have failed, and the old birds will seldom live in captivity.

The eagle referred to above as being mimicked by the lyre-bird is the white-bellied sea-eagle, *Haliaëtus leucogaster*, though the magnificent wedge-tailed eagle, *Uroaëtus audax*, is also found in the Blue Mountains. The white-bellied eagle comes in from the sea every evening about sun-down. It is irregular in its habits, and probably only a few come to the mountains to roost. As I could never find its nest in the mountains, I conclude that it always breeds on the sea-coast.

The wedge-tailed eagle does breed in the Blue Mountain range and throughout the mountains of the east side of Australia, and also in the larger islands off the coast, and I have obtained specimens from the western mountains of New Zealand. The bird has a very wide habitat in these regions, but I have not found it to be anywhere numerous. A pair seem to occupy a district which is not intruded on by others of the same species, though the wedge-tailed is not so quarrelsome as the sea-eagle, which has frequent squabbles with its companions and with hawks of other species.

Both eagles eat almost any kind of food they can find,

including carrion. I am strongly of opinion that this was not the original habit of either bird, for there could be little or no carrion in a land so scantily supplied with large mammals as Australia, and the carrion now consumed by these birds is furnished by the horses, cattle, and sheep which meet with an untimely end (as by drought, for instance) in the plains. In the mountains both species capture living prey, and frequently consume such small fry as rats, lizards, and snakes, as well as small birds. The carrion-feeding is, I think, an acquired habit, like the sheep-kidney eating of the kaka parrot of New Zealand. Both eagles are charged by the shepherds and stockmen with pecking out the eyes of young lambs and calves, and are consequently shot without mercy whenever they come within range of the guns of these men. I have not been able to verify the correctness of this charge. On one occasion I saw a wedge-tailed eagle carry off a recently born dead lamb, and it is reasonable to suppose that these large and powerful birds sometimes seize living lambs; but their numbers are too few to justify the charge of their causing serious loss to the stockmen. One man told me that a single pair of these eagles had caused him a loss of over sixty lambs by blinding them; but he could give no proof of the assertion, and I consider the story absurd.

The wedge-tailed eagle is much the finest bird of prey found in Australia; indeed, it is one of the largest of the accipitrines. I have seen specimens which measured forty inches in length; but though it is more than a foot longer than the sea-eagle, and in every respect a much larger and stronger bird, it is often attacked and soundly beaten by the marine species. The wedge-tailed eagle is, indeed, a timid and shy bird, and is easily alarmed. The report of a gun is sufficient to drive it out of a district, to which it may not return until many days have elapsed; nor will it defend its young from the plundering hand of the bird-collector, though its lesser kinsman, the sea-eagle, will bravely resent intrusion on its nest.

The sea-eagle preys largely on marine animals; but though I have watched it much, I have never seen it

actually fishing at a distance from the shore. It seizes fish which become stranded in shallow pools, and destroys large numbers of crustaceans and shell-fish. The shells of the latter it smashes against boulders and rocks, and it will also consume any dead fish or other animals thrown up by the waves, even if they are in a putrid state. It is a quarrelsome bird, and will drive away gulls or other birds of prey that chance to come near it, and all these seem to fear it. I have also seen it devour young sea-birds, which it procured from nests in the coast cliffs. Altogether, it may be termed the tyrant of the Australian bird-world. So far as I know, this bird is confined to the eastern coast of Australia, on which it ranges from Cape York to the southernmost points of Victoria. It is also found in Tasmania and on many of the smaller islands, the latter probably being only occasionally visited.

The wedge-tailed eagle, on the other hand, is spread over the whole continent, and is likewise found in Tasmania; and though, as I have already said, it is nowhere an abundant bird, it is perhaps more numerous in south-western Australia than in any other part of the country.

CHAPTER III

THE RIVERINE DISTRICT

THE interior of New South Wales, westward of the Blue Mountains, is a typical Australian country. Hot, desolate, and barren it is, but not waterless. It bears the name Riverine District on account of the great number of rivers which intersect it; yet a person may perish of thirst in this land of rivulets. The country has been seen in so flooded a state that it was thought unfit for occupation by the squatter. An Australian country too wet for habitation! A little reflection would have convinced any experienced stockman that this could not be.

In our strange and anomalous country the changes of climatic conditions are as marvellous as its productions are eccentric. In this Riverine District, twenty or thirty inches of rain may fall in a few days—then not a drop for a twelvemonth or more. The anxious explorer passes through a land which seems to be an interminable marsh blocking his way in all directions; and in despair he turns back. Next year another explorer finds the reported marsh a dry desert, and he turns back—not because of excess of water, but because he cannot find enough of it to preserve life. One year the land is parched and black and devoid of vegetation, the next it is covered with flourishing grass intermingled with a great variety of beautiful flowers, and swarming with animal life. It depends entirely on the amount of the annual rain-fall. And the squatter who is a meteorologist is the one who is most likely to prosper on these plains. Not that any man can anticipate meteorological conditions with certainty;

meteorology here is a branch of the science of chances. It may be anticipated that one year in fourteen will be a phenomenally wet one, and one in fourteen a more than phenomenally dry one. The intermediate years are all uncertain; sometimes a fair amount of rain, sometimes a few drops only. Sometimes it comes down as if it was emptied from hogsheads—in one torrent; and sometimes it drizzles down in a few scanty showers, with long intervals of time between them.

In a good year the sheep of the squatter increase as rapidly as those of Jacob; in a bad one he may lose his whole stock. The squatter, therefore, who prepares for a *non-rainy* day, and takes care to have by him the wherewithal to meet such a disaster, is the only one who is safe in this trying country. There are instances on record of squatters having lost every head of their stock; and such disasters too often entirely ruin the unfortunate men who suffer them.

Westward, beyond the Blue Mountains, the country appears to be absolutely flat. The rivers have no current. Many of them have not a fall of an inch per mile, and some of them not an inch in three or four miles. In dry seasons the smaller ones shrink into a series of ponds or mud-holes, or perhaps become entirely waterless; while some of the larger streams cease to be navigable by the small steamers and launches that ply upon them. The waters of even such rivers as the Murrumbidgee and Darling are quite currentless, and appear like canals. This, indeed, is their normal condition.

The country on the eastern plains is as desolate looking as it is in the west. The soil is generally darker coloured —almost black; there is little or no grass, and the herbage consists of puny tufts of mallee-scrub only a few inches in height. Here and there this scrub forms clumps of bushes which rarely rise higher than the traveller's head. The few trees that are met with are scattered about singly, or in twos and threes, and never form woods or groves. This is the summer aspect of the country. In winter, so-called, the land assumes a normal aspect. Grass five or six feet

high and thousands of bright-coloured flowers render the country beautiful and quite change its general appearance. Such is the magical effect of a few inches of rain.

Several of my friends owned extensive runs in this district; and I have lived there a good deal, and rambled extensively in all parts of it. For several years it was my pleasure to spend my holidays riding about the country collecting specimens and learning what I could of the habits of the strange wild creatures, which are so unlike those of any other land. Though born in the country and twenty-five years of age before I saw any other, I have always been fully aware of the abnormal character of the native fauna. Perhaps this is owing to the fact that I was at an early age plentifully supplied with well-illustrated works on natural science, and the forms and ways of animals in all parts of the world were made known to me.

Australia is not a land in which a traveller is likely to meet with many exciting adventures. There are no dangerous wild beasts to contend with; and although the "blackfellows" are apt to be cantankerous in some parts, collisions with them are not often heard of. The most exciting experiences are the sufferings occasioned by want of water or food.

One of the most trying accidents I ever met with occurred during a ride across the country from Dubbo to Cooper's Water-Hole, an outlying station on the Bogan river, where I was at the time employed. The distance was reckoned at a hundred and ten miles, and throughout the road lay over a desolate plain, where I did not see half a dozen men on the double journey. These were shepherds, wandering, like the patriarchs of the early ages, in search of fresh pastures: for some of the "runs" in this district are nearly as large as English counties.

We were short-handed at the station, which is a rule among squatters: for these gentlemen, like the captains of merchant vessels, generally like to run their ventures as cheaply as possible. Consequently, I was sent to Dubbo alone to transact some important business, and performed the journey thither without incident, except that I thought

that my horse (one of the best on the station) seemed unusually tired. I remained two days at Dubbo, and then started on the return journey, with, of course, the same horse. After I had ridden about sixty miles, my horse showed signs of great fatigue, which was quite unaccountable to me, for it was supposed to be an animal of great powers of endurance. In coming out I had passed a shepherd's temporary hut in (as I thought) this neighbourhood; and I walked the horse about for some hours in a vain endeavour to find it. Not succeeding in doing this, I resolved to camp out, though it was still early in the day.

There was a water-hole at the spot I chose, and materials for a fire; and I amused myself till dark with shooting the ducks, which are found on all the waters of this region during the winter-time. It was very lonely, and I passed a wretched time till the next morning, which seemed an interminable time in appearing. I did not sleep at all; and the horse, which was certainly unwell, after attempting to graze for a little time, lay down near me, and was as restless during the night as I was myself.

I lay on the ground wrapped in a cloak, and had to rise every hour at least to feed the fire, as there was only small wood growing thereabouts. As soon as it was light enough to enable me to see the way, I saddled the horse and started to finish the journey home. As every furlong was covered, I became more convinced that there was something serious the matter with the horse, till, when I had ridden six or seven miles, it suddenly fell, and in a few minutes was dead. This was an accident that quite unnerved me. I thought that I was at least sixty miles from home without, so far as I knew, a fellow-man near to me in any direction. I had a skin-bag full of water, but the scanty provision I had brought from Dubbo was exhausted.

At first I lost my head, and wandered up and down, sometimes thinking I would try to find the shepherds I had seen a day or two before, and sometimes resolving to return to Dubbo. Frightful memories of the fate of lost men in this desert, of which I had heard many stories,

recurred to me and increased my disquietude, for I was very young (under twenty years) and inexperienced. After the lapse of some hours, I found that I had wandered back to the spot where the dead horse lay, and I remembered having heard that it was the invariable course of an inexperienced person to move in a circle. I remembered also that the real bushman is said never to fall into this fatal error, and I recalled the rules laid down for circumstances similar to those in which I found myself. With some effort of will I recovered self-control, and sat down for a little time to think. I decided that I was more likely to reach home than to succeed in returning to Dubbo, and as I could not tell my precise bearings, I started westward, knowing that this direction would bring me to the river, on reaching which I should have no difficulty in finding my way to the station.

My equipment for this long tramp of sixty miles consisted of my water-bag, a pipe, with a pinch or two of tobacco, a box of matches, and a fowling-piece and partially emptied powder-flask and shot-belt. I had also a little tea and sugar, but no other food.

Endeavouring to keep a stout heart I tried to find the river, knowing that this was my nearest way home, and that by following its course I should be sure of an abundant supply of water. I felt confident that I should reach the station before hunger could greatly weaken me ; but when night fell upon the land I had not yet reached the river. Walking was very laborious work. The grass was high and the herbage thick, and my progress, in consequence, slow and very tiring too.

Ducks sometimes flew over my head, and I several times fired at them, but did not kill any of them, and I had to resort to the example of the native blackfellows, and satisfy my hunger with roasted fern-roots. I lay all night on the ground, and being now very tired, slept soundly. The fire went out, and I awoke at dawn stiff with cold, for the nights are often very chilly on these plains, and on this night there was a slight frost.

My water was now expended. I did not suffer from

thirst, but I did from hunger, the fern-roots not being of much more value as food for a white man than so much hay. I ate a few berries which I found growing on the plain, but these made me sick. Soon after I resumed my journey I saw the river on my right hand almost due north of the course I was taking. Much surprised, I supposed I had inadvertently taken the wrong direction, and I was thankful to know I should now have a sure land-mark to follow. Yet I was puzzled—the river seemed to be so broad, and there was a thick wood of trees which I had not previously seen or heard of. This was disquieting, as it seemed to indicate that I had wandered very much out of my way ; and my fears much increased when, after some hours of laborious walking, I found that the river seemed as far off as when first sighted, and I realised that I had been pursuing a mirage, and again turned my feet westward.

Soon the mirage was shining on all sides of me, showing a glaring white contrast to the deep green of the plains. These phenomena are much more prevalent in summer when the ground is bare than in the winter season, when they are exceptional. The effect is often most extraordinary and puzzling, for not only does water seem to lie in large and numerous pools close to the traveller, but there are also beautiful woods and groves where no trees exist perhaps for a distance of twenty or thirty miles. The bleakest desert is thus often turned into the appearance of a terrestrial paradise. Trees hang over the waters, or rise from the bosom of a bright-surfaced lake in graceful clumps. Not infrequently mountains and large islands appear, and the astonished traveller has these visions before his eyes, apparently within a half-hour's ride, while he journeys for days across an absolutely flat plain of the most sterile and monotonous type—a plain which does not seem capable in summer-time of supporting a mouse. Yet there is always a numerous population of wallaby, kangaroos, and birds here, besides millions of sheep and rabbits. How do these creatures live? Entirely on the roots of the grass and herbage which want but a

shower or two of rain to cause them to spring into a luxuriant growth which will quite change the aspect of the country in a few days—I had nearly written in a few hours. And that would scarcely be an exaggeration, so rapid is the growth of the herbage on the mere taste of water. Indeed, the grass and the ferns and the glorious flowers come like magic when the first of the winter's rains fall. It may sound strange to speak of winter being the time of beauty and fruitfulness, and summer as that of desolation and death; but so it is in Australia—"The Land of Anomalies," as it has been justly called.

It was about mid-day when I reached the river bank at a part which was quite unknown to me, and just as I did so I sprang a small wallaby from a tuft of dead grass close to my feet, and had the good fortune to kill it.

My heart was now filled with joy and courage, for the river was life to me in more senses than one. It was the guide to safety, and ensured a plentiful supply of water while I was wandering in this desert. As it was winter-time, the river was rather full, and there was a considerable number of water-fowl upon it—swans, ducks, ibises, rails, and cranes, etc., so that I had the prospect of obtaining food as well as drink from the life-giving stream.

In fact, from this point both my fright and my real troubles rapidly decreased. I had to live entirely on animal food without salt and vegetables, and I endured considerable suffering from the cold and damp at night, for it rained heavily several times, which prevented my making a fire. I contrived to cook a bird or two sometimes during the day, and thus I lived for nearly four days. Probably I wandered a little from the direct road, and I had difficulty sometimes in walking through the thick grass. It seemed to me that I walked much more than twenty miles a day, but it was not until the evening of the fourth day that I reached the point where the station ferry boat was kept, and my alarming adventure was over.

Now I am an old and experienced bushman, and should think little or nothing of such an experience as that I have just narrated. It is a very rare thing for an

old Australian bushman to be lost; it is quite as rare an occurrence for a "green" hand to escape. Even intelligent strangers get bewildered in the bush, and seem to have no better idea of taking the right course than a young child would have. To the true bushman it seems ridiculous that a person should wander for hours, and quite possibly for days, without moving a mile away from the spot where he first lost his reckoning. Yet this is the rule. Over and over again has it been proved that men have moved round in a small circle for more than a week, and ultimately died of exhaustion within a few hundred yards of the place from whence they started on the walk of death. Not only so, but on two occasions I have known of men dying within five miles of the houses where they had received hospitality, and in one of these cases the man must have lived a fortnight, constantly moving round a circle which never had a diameter of a mile and a half. He must have repeatedly passed his old fire-places, and perceived that he was making no headway in any direction, and yet seemed unable to break away from the fatal circle. What is the explanation? It is difficult to give an altogether satisfactory one. The strange conduct of some wanderers in such circumstances is suggestive of insanity. But some well-known facts, coupled with the narratives of rescued persons, point to the explanation that the lost persons have simply perished owing to *fright—bewilderment.* It may not seem much to be lost on a wide plain or in a forest—an account of such an adventure does not make very exciting reading in a book—it is really very unnerving to the wanderer who does not know how to act with *assured confidence* in such circumstances; and the more he finds himself involved, the more his consciousness that he is lost seems to have a paralysing effect on the mind of the wanderer, rendering him incapable of vigorous thought or action. Sometimes he even dies of sheer fright; and some, after a time finding they continually return to the same spot, give way to despair, lie down, and make no further effort to save themselves.

Often the question has been put to me: "But how is

it that lost persons have not the gumption to follow the sun, or to move in a line from one fixed object to another?" There is very great ignorance on such points as these. "I was told if I kept my back to the sun I couldn't go wrong," said a man who was found in a state of exhaustion on the Bogan plains. It is not worth while to inquire which was the more ignorant, the person who gave this advice, or he who was guided by it; but it was the cause of the latter moving round in a circle, from which he could not break away, although in a very few hours he discovered that he was going wrong. Following fixed objects is also a very uncertain and unsafe plan, for it is impossible to keep the attention fixed for long on obscure objects such as trees, bushes, boulders, and so on, in a country where the scene is constantly, though perhaps but slightly, changing. The educated traveller has a compass, and this is a sure but troublesome guide; the true bushman relies on his instinct—an instinct that soon comes with experience and practice—and this is an even surer guide than the compass. The compass cannot lead to water or to the best route. These and other necessary or desirable objects seem to be as discoverable by the bushman's instinct as surely as they are by that of the brute or the bird. Certainly, a bushman or a native black will strike a straight line from place to place over any description of country and for any distance. If they are compelled to diverge from the true line for a time to avoid impediments, as lakes, marshes, or hills, they nevertheless have no difficulty in resuming the true direction as soon as the obstacle is passed.

The instinct of the native blackfellow in this respect is passing wonderful. Nobody ever heard of a black perishing from inability to look after himself in the desert; and if anyone asserted that he had known of such a case, I should receive his statement with much doubt. The black never perishes from hunger or thirst, or from being out of his latitude. Game is scarce sometimes, and he strives to numb the craving of his stomach by tightening his hunger-belt, but he never dies of actual starvation.

If he cannot capture just when he wants them the wallaby or the emu, he puts up with such fry as snakes, grubs, and lizards, or sneaks round the station to beg the offal from the slaughtered sheep; a meal of some kind he always succeeds in finding. Is there a drought in the land? He seems to smell out the few remaining water-holes, so skilful is he in finding them. As to his hunger, which the traveller or other observer too frequently erroneously puts down to scarcity of food in the land, it is far more often the result of his laziness. Often the idle fellow will lie in the sun, or under shelter of his scanty lean-to, until his hunger-belt no longer serves its object, and he must eat or suffer. Then he gets upon his feet, orders his gin to bring his weapons—his spear and throwing-stick, his boomerang and perhaps his hand-net for fish—and, followed and assisted by his faithful slave, whom he probably beats out of mere ill-temper at having to exert himself, he soon has the wherewithal to gorge like a vulture; and he does gorge like a vulture. Like other savages, alternate want and excess seem more to his liking than a daily moderate allowance. He cares not to eat or drink at all, unless he can do so to satiety.

On my return to the station I found the hands anxious about my prolonged absence, and two men had been sent to look for me. They found the dead horse, and reported its death to be due to a diseased heart, that organ having been found on examination to be enlarged to an extraordinary degree, though it had never been suspected that there was anything the matter.

I now look back with amusement to the scene which occurred on my appearance, though I was at the time greatly hurt by it. The loss of the horse was considered a far more important matter than my peril, and the anger of the owner was almost without bounds. The animal's death was attributed to my mismanagement. "They might have known it! Served them right for entrusting a valuable animal to a —— Johnny Raw!" Then followed some uncomplimentary reflections on my personal appearance. "What were they thinking of that they had not

discerned spooney in every lineament of my countenance? Did I know how to spell ass? Had I ever seen a mule?" All these vituperatives being emphasised with adjectives of a force only heard, I should think, in Australia.

Being young and "green" I was greatly incensed at this injustice, the more so as, on the real cause of the horse's death being discovered, no apology or expression of regret was offered me. Then I, in turn, lost temper, and, I am afraid, gave ample proof that in time I should know how to "tackle a 'Johnny Raw.'" This only amused the "old hands," who declared, with glee, that they liked to hear a young pup bark, and see him show his teeth.

CHAPTER IV

ORGANIC LIFE ON THE RIVERINE PLAINS

I HAVE already said that animal life is never absent from the deserts of the Riverine district. The giant kangaroo, commonly called "the old man," has become very cautious, and is only found now in sheltered spots remote from the neighbourhood of the habitation of man. Wallaby are numerous in many places; they were formerly found everywhere in the district; and rabbits during the last few decades have become a dangerous nuisance. "Dangerous" may seem a strong word to use, but really the increase of this troublesome rodent has become so great and persistent that it is a question if it will not ultimately oust the sheep from the district, and ruin many large squatters. Nothing that has yet been done to diminish the number of rabbits in this and other districts has been perceptibly successful, and it looks as if we shall presently have to talk of "billions" rather than "millions" of rabbits. But there are districts which are infested in a greater degree than the Riverine, and I shall have to return to this subject in another chapter.

Standing on the plains west of the Bogan in summer-time and looking round, one sees nothing except a desolate plain, dark coloured almost to blackness. Not a green thing is visible, not even a blade of grass. The few trees, mostly standing singly, seem to be dead—and many of them really are so, perhaps because the wallaby and the sheep have gnawed the bark. None of them show green leaves, and the few bushes, seldom rising more than a couple of feet from the ground, are also bare. For in a

season of drought even the evergreens shed their leaves. Looking closely at the ground, it is seen to be covered with withered root-tufts of grass and herbage; and on this miserable-looking forage the sheep and the wild animals not only thrive, but fatten as in a land of Goshen.

Water has to be found for the sheep, and this is the great anxiety of the squatter. In winter the rainfall is stored in water-holes artificially constructed, but the supply thus collected usually fails long before the summer is over, though it is husbanded with the most anxious care. Sometimes there are natural water-holes, situated far apart, on a sheep-run, and these may last a long time; but on the run where I spent most of my youth we often had to dig for water. This was sometimes found at depths of twelve to twenty feet, but we occasionally dug wells a hundred feet deep without finding it. If we were fortunate enough to discover a supply, it had to be drawn up to the troughs with hand-pumps, and this was work invariably put upon the new chums, or "Johnny Raws," as they delighted to call them on our run. Frequently have I spent whole days incessantly pumping till my arms felt wearied and strained to the point of leaving the shoulder-sockets, but never have I found a squatter, or "an old hand," who had the slightest care for, or sympathy with, a new chum. All the dirty and laborious work on a station is allotted to the unfortunate individual, the latest arrival at the station, who bears the title of *new* chum; and the more he complains the worse is his lot. Should he presume to remonstrate, all hands delight to find fresh means of annoying and oppressing him, and the best thing he can do is to submit with such grace as he can command. In time things find their level.

The most common birds on the plains are carrion crows, and they are always there in thousands. They are very rook-like in appearance, and have the same call note as the English rook. Their cawing is incessant, and may often be heard on moonlight nights till long after midnight. Like all the genus, they are exceedingly restless birds, and have a very bad repute with the squatters, who make the

same charge against them as is made against the raven in Europe—that they destroy young lambs. They certainly do peck out the eyes of many newly-born animals, lambs in particular, and the field-hands such as shepherds, stock-riders, and the swagsmen (or tramps) have an inveterate hatred of them, as they say they hover over sick and dying men in the bush, and begin tearing their flesh as soon as they perceive they are helpless, and long before they are dead. Carrion forms the bulk of their food, but they also eat young birds, rats, and grubs and insects of all sorts, and any odds and ends they find lying about the stock-yards and houses. For they are the boldest of birds, fear man but little, and will enter open doors and windows without hesitation. The same may be said of the magpies, as the colonists call the piping-crows, which are nearly as abundant on the Riverine plains as are their carrion brethren, but from which they differ much in habits.

There are two species of piping-crows in the Riverine district, the black-backed (*Gymnorhina tibica*) and the white-backed (*G. leuconota*). As may be guessed from their names, these two birds differ from each other but little. They both have pied plumage, and here, in the Riverine, the black-backed is the species most numerous in individuals. Further south, in Victoria, the white-backed predominates. They are harmless birds, and are great favourites with the colonists. There are but few homes, humble or great, that have not a piping-crow for a pet, and they may frequently be seen hopping about the stock-yards and enclosed paddocks in a state of semi-liberty. They become much attached to persons who are kind to them, and though they never learn to speak more than a word or two, they often imitate the barking of dogs, squalling of cats, and similar domestic sounds, while they whistle and scream like parrots, and utter their own pretty song.

On the plains they appear in small flocks, which are numerous, but never exceed twenty individuals and are oftener less than a dozen in number. They will permit a man to approach them pretty closely, and on being alarmed

generally fly no further than the nearest gum- or ty-tree, where they sit watching the intruder, chattering, piping softly, and occasionally uttering a very similar caw to that of their carrion relative. They are affectionate birds amongst themselves, and are not as mischievous as most crows. They feed on insects of all sorts, and will, occasionally at least, consume carrion and filth of all sorts, and also any scraps they find about the homesteads of the colonists, but they never attack living animals of any kind, great or small.

The nest of the piping-crow is often placed in the solitary gum-trees and ty-trees which are scattered about the plains, sometimes three or four nests in one tree. The eggs, three or four in number, are typical Australian crow's eggs, which differ considerably from those of European crows. Those of the piping-crow are white in ground colour, with a faint bluish, greenish, or reddish tinge, and closely blotched with bright brown and purplish-grey markings.

In winter-time, when the water-holes are full and there is marshy ground near the rivers, black swans, and the crane, commonly called "the native companion," are numerous. There are also white swans and ducks in great abundance. The black swans may be seen in flocks of sixty or eighty, and natives and old stock-riders say that formerly flocks often numbered several hundreds. They have been much persecuted, many trapped, and others shot, often wantonly, I fear: hence the reduced numbers.

The plumage of the black swan (*Cygnus atratus*) would be better described as blackish rather than actually black; it is never a deep or bright black. The primaries are white and the beak reddish; the rest of the bird is a dull black colour. The habits of this swan are similar to those of the white species; but the two birds keep strictly apart, and I have never had so much as a suspicion that they ever breed together.

In a few points the black swan differs from the white species. It does not fly so high, so fast, or so freely as the

latter bird, and it lays fewer eggs in a clutch—usually not more than six, and never more, in my experience, than eight, though I have found as many as a dozen in a white swan's nest. The nest is placed in different situations, according to circumstances. I have found the nest of the white species among rocks on the coast; and they often breed on rocks at a distance from the shore. I could never ascertain that the black swan has this habit. In the Riverine the nest is usually placed in the midst of an impenetrable marsh; and I have found one or two hidden in the thick rushes of the Bogan and other large rivers. The plumage of the young bird is of a grey colour.

The nest of the native companion (*Grus australiaca*) I never succeeded in finding. The crane is a fine, handsome bird, standing sometimes nearly five feet high. The plumage is a handsome blue-grey in colour. These birds never assemble in flocks. Four or five are sometimes seen together, but pairs are often met with; and I think it may safely be asserted that the union of the male and female is for life. Like that of other species of cranes, the attachment of these birds for each other is very great. If one is killed, the other will come back and hover about the dead bird; so that the sportsman is sure of the pair if he succeeds in shooting one. The chief food of the native companion is eels, lizards, frogs, and snakes; and, as they destroy many poisonous snakes and other troublesome vermin, they ought to be strictly protected. I do not think they catch many fish (eels excepted), but they have been seen by me to devour rats; and they often destroy the young of marsh breeding birds. They have a peculiar habit of prancing to and fro—dancing, I suppose some naturalists would call it. This only happens when several pairs are together; and the object of the exercise I could never discover. Their movements on such occasions are not very quick, but are rythmical and graceful.

The Australian bustard is also a prominent object on these plains, as well as the swan. I will defer describing the latter bird for the present.

The bustard (*Eupodotis australis*) is a large bird weighing at least twenty-five pounds; and, contrary to what is reported of the European bustard, when pursued it will run, and not fly; and no dogs that I have seen pursue it could get near it. It is a very shy bird, with an acute sense of smell; and it is useless to attempt to approach it except against the wind; and then the sportsman will probably be detected before he gets within three hundred yards of it. It can only be shot with a rifle.

On account of the difficulty of approaching the Australian bustard, I have not been able to study its habits very closely. I know that it eats large quantities of insects, particularly cicadæ, and condescends to prey upon very minute animals of this class. It also consumes small frogs and lizards, but I have not found other animal food in the crops of the few I have shot. In one there was a great mass of small seeds, and in another the remains (elytra and legs) of many small beetles. Often a single bustard may be seen running across the plain, sometimes a pair, but rarely a party of them together. The Australian bustard, therefore, is not gregarious.

I have taken but two nests of this bird. In one there was a single egg; in the other, two; in both cases, the clutch may have been incomplete. The eggs are light brown, thickly sprinkled with spots of a darker hue. There could scarcely be said to have been a nest under the eggs. The coarse grass was pressed down and arranged round a hollow, looking more like the lair of a mammal than the nest of a bird. The spots chosen were in the midst of dense scrub on the open plain, and the eggs harmonised so well with their surroundings that they were difficult to discover, as, I may add, is the bird itself; for on one occasion I got quite close to a sitting hen, and should certainly have passed her without discovery had she remained quiet. The mad rush with which she dashed away was quite startling, and her speed so great that she was quite a hundred yards away before I recognised her to be a bustard. This bird had but a single egg under her, which was evidently recently laid. I had the nest

carefully watched, but she never returned to it. It is then presumable that the bustard, under the influence of fear, will abandon its nest.

Of mammals the great kangaroo (*Macropus giganteus*) is by far the most important found in Australia, and is so typical of the country that it is impossible to mention it without causing the mind to revert to the *terra australis*. In the Riverine district it is now scarce. It affords such excellent sport in a run across country with dogs that the ardent squatter sportsmen have nearly exterminated it in this part of the country, and indeed in all the settled districts.

The great kangaroo is the most elegant in build and appearance of all the kangaroos. I do not know how many species of kangaroos there are in Australia, nor where the kangaroos end and the wallabies commence. It is clear that the two types form but one family, and differ in little except size, though the smallest species, some of which weigh only a few ounces, are extremely rat-like in outward contour. There are at least a dozen species of kangaroos and wallabies in the district under description; and it may be useful to mention that in the popular descriptions of the country the largest of these marsupials are termed kangaroos, the medium sized are distinguished by their native name of wallabies, and the very smallest are called kangaroo-rats. The notices of all these animals will be incidental throughout this work. They are so universally distributed in the country that they must be referred to in all parts of it; and to pick out all the information regarding any one species for record in any particular chapter would lead to the mutilation of many interesting incidents and descriptions. The name wallaby is certainly of native origin, and is still used in many parts of the country by the aborigines, but not by all. Tribal names for kangaroos and wallabies are very numerous, and differ much in different localities. The word kangaroo is probably a corruption of wallaroo, the name given to large kangaroos generally in various parts of eastern Australia. At any rate, none of the aborigines

now use the term "kangaroo"; nor does it appear that they ever did so.

The animal is so well known that a general description of it is not necessary. Fine specimens of the great kangaroo are about 5 feet in height when sitting upright, and the total length from the snout to the end of the tail is often as much as 10 feet. The tail, owing to its thickness, is much longer than it looks; it may be taken, roughly, at about two-fifths of the entire length of the animal. The weight varies much with locality and season. The dimensions of the three largest I have shot are as follows:—One killed on the Darling plains, about forty miles north of Blaxland: total length 9 feet 10½ inches, tail 4 feet 2 inches, weight 255 lbs. Another from the same locality, 8 feet 11 inches, tail 4 feet 5 inches, weight 189 lbs. One killed near the station on Bogan river, 8 feet 10 inches, tail 4 feet 2 inches, weight 203 lbs. All these were males.

Other kangaroos and wallabies in the district are the black-tailed wallaby (*Macropus ualabutus*), about the size of a poodle, but sometimes weighing 60 lbs.; the padamelon wallaby (*M. theditis*), length of fine specimen from nose to root of tail 24 inches, tail 18 inches, weight 16 or 17 lbs.; red kangaroo (*M. rufus*), length 55 inches, tail 40 inches, weight 152 lbs.; red-necked brush-kangaroo, length 3 feet 6 inches, tail 2 feet 6 inches, weight 80 lbs. These are the largest and most important of the kangaroos found in the Riverine plains, and they are found more or less plentifully throughout the eastern side of the continent.

Some of the smaller wallabies are not more than a foot long (exclusive of the tail), and do not weigh more than a couple of pounds. The shooting of these small wallabies is better and more exciting sport than rabbit-shooting, and they are an excellent article of food. I cannot give the specific designation of all those that inhabit the Riverine and Darling plains; but the hare-wallaby (*Largochestes leporoides*) is one of the most abundant. The average length of this wallaby is 18 inches, and I shot exceptionally fine specimens which exceeded 22 inches, tail about 10 inches, weight a dozen pounds.

The habits of all these species are remarkably similar. They all go in small herds or droves of from 40 to 200. The herds of the larger kinds are often locally called "mobs." Odd individuals are only occasionally met with, and are always large males, seemingly only temporarily separated from their herds. Each herd keeps distinct from others, and they never congregate in vast droves, like many species of deer. They all feed on grass, herbage, and leaves, as well as on bark and roots. They cause the death of many trees by their gnawing habits. They all drink but sparingly, and can go long periods without drinking at all; and all have the same habit of lying in patches of scrub, from whence they make excursions over the surrounding country, but seldom, I think, travelling any great distance from home. It is only under pressure of drought that they migrate considerable distances; but fright, occasioned by being shot at, or harassed by dogs, will cause them to forsake their habitual haunts.

Two species of rat-kangaroos are very common in this district—the brush-tailed (*Bettongia penicillata*) and the potoroo (*Potorous tridactylus*). The hind legs excepted, the latter is a very rat-like animal in superficial appearance; and both species are about a foot in length, with tails eight inches long. There are several local varieties of the potoroo, one being much larger than the common species.

All the kangaroos and wallabies mentioned above feed at night as well as during the day; but the rat-kangaroos are more nocturnal in habits than any of the others. All alike are exceedingly timid; but, like hares, lie until they are almost trodden on, when they rush away in wild hops and leaps, and at a very great rate of speed. The smaller kinds are therefore difficult to shoot, their many angular turns and twists making a steady aim impossible; and they must be knocked over with snap-shots. The rat-kangaroos are not often used as food, except by the blackfellows; but this is a result of prejudice, the flesh of these little animals being quite as good as that of the rabbit. Their leaping powers are very much less than

those of wallabies proper, and some of them walk and run much like a rat. All carry the body much less upright than do the larger kangaroos; but it is in the structure of the tail that these animals differ most markedly from the kangaroos. That appendage in the rat-kangaroos is partially prehensile, and they carry bunches of herbage with it to their lairs; for these animals, and many of the wallabies, have lairs like hares; but none of them have burrows, or occupy holes or hiding-places of any kind—all lie in the open.

The reproduction of kangaroos is the most extraordinary peculiarity of the family. For many years it was believed that the young entered the marsupial pouch through the teats of the female. They are, however, born in an embryonic state, and transferred to the nipple by the female herself. When she is not with young the teats are sunk completely in the skin of the abdomen; but when in use they project in varying degree, according to the stage of development of the young. The newly-born kangaroo or wallaby is so small and undeveloped, that it may easily escape the notice of a careless observer. Even in the great kangaroo it is scarcely an inch in length, and looks, in its first stages, like a malformation of the teat. It is quite undeveloped—a mere worm in appearance—and so firmly affixed to the nipple that it may be correctly described as grown to it. So much force is necessary to detach it that both the young animal and the nipple of the mother bleed freely, and the former dies in a few hours, or, perhaps, in a few minutes. The young kangaroo, called by the colonists a "Joey," is fully developed before it becomes naturally detached from the nipple. At that period it is about the size of a rat, and is very active, jumping from the pouch with great activity. In some species of wallaby, however, the young are placed in, or taken from, the pouch by the mother. There is, usually, with all species, but a single young one at a birth—never, according to my experience, more than two; and I do not think that any species breed more than once a year. It is extraordinary, therefore, that these animals are so

numerous; and were, a few years ago, much more so. The explanation seems to be, to some extent at any rate, that there are few beasts of prey in Australia. Mammals of the weasel and pole-cat kinds are not represented in Australia, and there are no cats. Those small carnivores in most countries are the prime destroyers of the smaller forms of animals. The dingo is the most formidable carnivorous mammal in Australia, and he destroys but very few kangaroos. An odd one or two may occasionally fall a prey to his fangs; but he has to be cautious in attacking the larger kinds, and dare not do so when they are in herds. The quick stroke of a kangaroo's hind leg will cut dingo or dog through the backbone like an axe; and an "old man" is a match for a dozen dingos.

The kangaroo-hound is a breed of dog of modern production, specially bred for the sport of kangaroo-chasing. The requirements of the sport are a swift-running dog of powerful jaw; but no dog can throw an "old man," and the assistance of the hunters is always required to despatch him; and if that assistance is not very speedily rendered, he will disable dog after dog with great rapidity, every stroke of his powerful sharp-toed foot bringing a fearful wound to the unfortunate dog at which it is aimed. Dogs are frequently ripped open, or cut nearly in two; and the first hunters that come up to a kangaroo at bay spring from their horses, and, seizing its tail, hold it up. This prevents the animal from lifting its leg to strike; for if it attempts to do so, it immediately loses balance. Thus assisted, the dogs pin it by the throat, and soon have it down.

It seems a cowardly thing to deprive the poor "old man" of his only means of defence; but were it not done, it is tolerably certain he would kill half the dogs, and ultimately escape. As it is, he is a most formidable antagonist, and often kills several of his foes before the hunters come up.

The large kangaroos afford a very sharp and exciting, but not very long run. They are generally overtaken and brought to bay by the dogs within a distance of two or three

miles. The country to be ridden over is generally of a nature to try severely the nerves of a stranger. It is studded with fallen tree-trunks, and other formidable obstacles, over which the kangaroo goes in a series of easy, graceful-looking hops, that are often at least thirty feet in length; but he cannot clear an obstacle of greater height than about four feet. Fences, therefore, are an insuperable obstacle to kangaroo-chasing.

If accidents are to be avoided, trained horses must be used for this sport—as they always are by the colonists. The rule is to let the horse have its head; and a well-trained horse becomes so clever that if an accident does occur, it is almost surely the rider's fault. My experience of kangaroo-chasing is that a spill is more fatal to the horse than the man. The upset generally occurs at fallen timber, and the horse has two bad chances to face—it may break its back, or be impaled by a projecting snag. Of course the man has the same risks; but it is child's play for an old stock-rider to clear a falling horse.

CHAPTER V

THE RIVER DARLING

I HAVE rather abruptly closed the account of the animal and plant life of the Riverine district in the last chapter. The fact is that to describe all the living creatures found there would be to enumerate nearly the entire fauna of the continent. But it is to be understood that I consider the Darling River system as part of the Riverine, and the animals mentioned here are found generally in the central plains of New South Wales unless the contrary is expressly noted.

The Darling is not a Ganges, a Mississippi, or an Amazon, but it is out of all comparison the largest and most important river of Australia. It is at least 2200 miles in length, but without a proportionate width and depth; yet it is navigable when in full stream for small steamers nearly to its source. It bears at least twenty different names, the last three or four hundred miles of its course being often most improperly assigned to the Murray, though Australian geographers as a rule term it the Darling to its embouchure at the sea. The source is in the New England range, a ridge of mountains forming the backbone of what is locally called "the New England district," but the actual source is not known, and never will be. It is one of many hundred billabungs or collateral streams, which are continually shifting position and varying in number. "Billabung" is the aboriginal name for what in England is termed a "backwater." Billabungs are rarely or never permanent, and sometimes only exist in a district in winter-time.

Whichever of the many streams is the source of the Darling, it starts in life as a mountain-torrent, rushing down through rocky gullies which are overhung with giant gum-trees and often choked with fern and brush growths, and presents a beautiful and picturesque sight to the eye of the rambler. Soon, however, these billabungs reach almost level ground, lose their impetuosity, become actually currentless, and, in summer, degenerate to "a chain of water-holes," a description that has been applied to almost every river in Australia. The bed of the river here, as in most other places, is sandy and very absorbent; but it has been discovered that the water often runs underground, as in other deserts of the world, and reappears where there is a fall in the level of the land or the soil is hard and firm.

Except where it rushes through deep gullies in its first reaches, the Darling has not high or rocky banks, and does not generally run through forests, but has a fringe of timber two or three miles wide on either bank. Taking a general view of its entire course, it may be safely asserted that no other river of the same length on the earth's surface has so little change of scenery, or is so lacking in the picturesque element. Sometimes its course is over arid and most desolate-looking plains which do not seem to rise two feet above the general level; sometimes the banks are quite bare of trees, and sometimes there is a thin fringe of timber.

In the winter, especially after those sudden bursts of rainfall, which is one of the characteristics of this region, the country is flooded for a distance of several miles on either bank, and billabungs and temporary lakes galore are formed. But the floods do not last long. The thirsty soil will in many places drink in an eight- or nine-inch rainfall in a few hours, leaving only a mud-hole or two to show that the earth has been wetted. A detailed description of the whole course of the Darling would be as monotonous as the country through which it flows. At one part there is no perceptible fall, and consequently no perceptible current, for a distance of three hundred miles. Everywhere on the central plains the river is as quiet and smooth as a mill-

pond, and in dry seasons it is fordable at hundreds of places. Going down the course one frequently notices the extraordinary way in which the bed narrows, yet without causing a current. The river seems about to lose itself in the sands, as so many Australian rivers do. It narrows sometimes to less than fifty yards, then suddenly widens to a lake-like expanse three or four hundred yards across.

Near the centre of the river—that is, about a thousand miles from its source, and a similar distance from its mouth—there are some ranges of low hills approaching close to the bank, and isolated groups stand out from distant plains. Contrasted with the flat country causes these hills to appear much more lofty than they really are. The appearance of some of them is peculiar: all appear bare, or at most, with stray trees and bushes and tufts of herbage scattered over them. None look green, and none seem to exceed three hundred feet in height; most of of them range from one to two hundred feet. Some of those that we could trace on a map, and that bear the designation of "Mounts," do not rise a hundred feet above the plain. Hills seen in the extreme distance, but which we had not time to visit, might be higher; but it is probable that there is not a hill of five hundred feet in the whole quarter of a million square miles of plains which the Darling and its tributaries are supposed to drain.

The plains are arid in summer, and covered with grass and patches of salt-bush and scrub in winter. Isolated trees are scattered about as in the southern parts of the plain, and near the river these trees form a belt of superior size and growth, some of them being a hundred feet high. The species is mostly the red-gum, and at a greater distance from the river there is often a fringe of the box-laurel. In winter the whole plain is rich with flowering plants.

About the head-waters of the Darling, and for a considerable distance across the plain, small townships and stations are numerous, and along the whole course of the river, outlying stations are established at intervals. These depend for communication on the steamers which regularly

ply from place to place. The service, however, is very irregular in summer, as then there is often insufficient water to enable the boats to traverse the river, and the danger from snags, always great, is much increased. The bed of the river is full of these submerged tree-trunks, and though thousands are annually removed, others soon take their places. A constant lookout has to be kept on the boats to avoid them, and at night-time a powerful reflected light (often now an electric light) is thrown ahead to reveal their position, for these snags are quite as dangerous as rocks.

I have visited all parts of the river, and taken many rambles in the adjacent country on both banks, but I have no adventures to record. There is a sparse population of blacks along the river, and they are said to be dangerous; but such dreadful vengeance is taken for any outrage committed by them that they are usually afraid to attack a party of whites. A few wandering swagsmen, perhaps, fall victims to their savage cruelty, but if they meddle with the shepherds or boundary riders, they have speedy cause to rue it. They are under the protection of the law, and it is a serious offence to ill-use or kill them, but the Darling plains are wide, and the law cannot take cognisance of all that occurs there. No evidence can be collected—no jury will convict. It is understood among all classes of whites, that outrages on the part of the aborigines must be put down with a hand as prompt as it is heavy. I do not think that there is now much cruelty practised against the blacks, and perhaps the loss of an occasional sheep is not much resented by the squatter. But if the lonely shepherd or the wandering traveller is murdered or even maltreated, black blood pays the penalty of the outrage. It is useless for the offenders to attempt to fly. The white man knows that he must, for his own safety, teach them a lesson, and they are hunted down with determined persistence, the "station blacks" being used all too willingly, to track their savage brethren. What follows is never known to "constituted authority," for if any eyes but those of the avengers see what happens, they

are blind to that which they believe to be a necessary breach of the laws.

There are usually a few blacks hanging about the stations and squatters' homesteads, known as the station or friendly blacks. These live largely on the eleemosynary gifts of the squatter's family and the station hands, for when the blacks are well-behaved they are kindly treated and often almost petted. Sometimes they condescend to do a little fitful work; and they are always useful to break the monotony of station life with their corroborees and other fantastic tricks. They are also extremely useful in tracking lost cattle and horses, and may sometimes be trusted to go errands to other stations, or to the nearest store. Not infrequently they become much attached to the whites, and some of them have rendered good service to explorers and other wanderers in the deserts. But they, one and all, have this failing—they cannot settle down permanently to civilised life. Sometimes they will work well for several consecutive months. Then the wild spirit comes upon them, and they must take to the bush. If not permitted to go, they run away. In this case, they will probably not return. If their absence is not resented by their employer, they generally, after a time, return and do another spell of work. If permitted to play and work alternately, they will serve one master for many years, and kindness of treatment is almost sure to win their strong attachment.

About the station they are thankful for any trifle that is thrown to them, and they share the garbage with the dogs. They are always at hand when a sheep or bullock is killed, and run off with the entrails; and if they are permitted to take the liver, heart, or head, they think they have a lordly feast in store, and their supper is almost sure to be followed by a corroboree.

The hands give them their old clothes, and the squatter's wife looks after the women; and some preposterous rig-outs are frequently seen, the blackfellow having no idea of congruity in dressing himself in European garments. Certain articles of dress are so highly esteemed that when

the blackfellow succeeds in possessing himself of them his vanity is boundless. "You see my hat, sir?" said one of them. "You no tink him berry fine fellar?" Certainly the ladies of his tribe regarded him with open-mouthed admiration.

The general habits and customs of the Australian aborigines are so well known that it is unnecessary to repeat them here. Too often an unsavoury savage, he is not always irreclaimable, and occasionally forms a strong attachment to the white man. Here is an example, and read *between the lines*, I think there is not a more pathetic instance in the annals of Australian exploration, or one that shows the savage in a better light. Kennedy, the explorer, and one black attendant, Jacky-Jacky, are running through the bush for their lives, closely pursued by a band of bloodthirsty blacks. Jacky-Jacky used all his savage ingenuity to throw his fellow-savages off the scent, and for three days and nights bewildered them. Then he and his master were surrounded, and spears thrown which wounded Kennedy desperately in several places and Jacky across the forehead, but Jacky was equal to the terrible emergency. He succeeded in carrying his dying master into the dense scrub and escaping the savages, who were still afraid to close in on the two devoted men.

"You feel better now, sir?" he asked, as he laid Kennedy carefully down to rest.

"No, Jacky, no. I do not care for the hurt to my leg, but oh! this wound in my side."

"Are you going to leave me, Mr Kennedy?"

"Yes, Jacky, I am dying."

"Ah! blackfellow always die when him get spear wound there," explained Jacky, who doubtless remembered the results of many savage encounters in his bush days.

"You must take the books to Captain Dobson; be sure to take the books to him," said Kennedy, evidently anxious that the results of his work should not be lost. Then he added, "Give me a piece of paper, Jacky: I will write." But he was too far gone. He leant back

against Jacky, and died with the pencil between his fingers.

"Then I go way little bit, and cry long time," said Jacky. "When I feel better, I go back and dig grave with axe, and bury Mr Kennedy, and put my shirt and trousers on him. When it come dark, I go way and leave him. The blackfellow follow me and throw spear, and I go into ribber and walk with only head above water and so escape." And after two days Jacky-Jacky reached the coast, and hailed the schooner which was waiting for the members of Kennedy's party. A boat was sent ashore to take him off, and found him to be in a greatly exhausted and shaken condition, believing the hostile blacks to be still close on his track; but he had been faithful to his trust, and had brought Kennedy's papers safely to the terrible journey's end.

The man who cannot respect and love this poor courageous blackfellow must be seared of heart and brain.

Several times during my rambles on the Darling I met with the aborigines. They were quiet enough, but probably not to be trusted. Of course I always had several companions with me, and we were all armed, which kept the savages in awe. They attempted some trifling thefts, but no violence, and considering the abject conditions in which they live, one cannot be surprised that they covet the white man's treasures, and endeavour to possess themselves by craft of that which they have not the means to purchase.

The aborigines are not numerous on the Darling or the adjacent plains; but further north, in Queensland, and especially on York Peninsula, there are considerable numbers of them; and in these latter districts they are sometimes very aggressive. Indeed they are only to be trusted after long intercourse with the whites, and not always then.

The corroborees alluded to above are often described as dances. They are really dramatic performances, given mostly in dumb-show, and nearly always represent such

episodes of savage-life as the surprise and slaughter of enemies, battles, and hunting scenes. To the white who has learned to understand them they are amusing, and the skill with which the actions of animals and men, under the conditions given, are represented is remarkable, and shows the blackfellow to be a man of great intelligence, and a past-master of the art of mimicry. Descriptions of corroborees are to be found in the works of nearly all writers on Australia; but these are not always very intelligible owing to the authors not having well understood what they have witnessed. The actors usually envelop themselves in various coloured paints—red (called "wilgy" by the natives of New South Wales) and yellow and white being the only hues, often arranged in grotesque patterns, and oftener still drawn along the lines of the bones, thus making the corroboree-actor look like a living skeleton. Songs are sung, but there is never any dialogue, at least I have never heard any. Single actors sometimes boast of their individual prowess, but this is occasional only, and not customary.

The Darling plains blacks are not such fine people as their brothers to the north in Queensland, nor are they generally in good condition—why I cannot surmise, for there is still an abundance of game on the land, and of fish in the rivers. As in the days of Sturt and Mitchell, the aborigines of this district still suffer from a form of ophthalmia; and some of them are nearly blind. Horrible to relate, when they become quite blind, and consequently helpless, they are abandoned by their companions, and left to perish miserably in the desert. Some of them told me that a man thus afflicted contrived to follow his tribe for days begging piteously for food which was not given to him, and at last he was knocked on the head with a waddy that they might get rid of what they considered a nuisance. But such instances of cruelty as this are not universal among the blacks. Some tribes treat their old and decrepit members kindly.

Many of these people also suffer from loathsome skin diseases, brought on, probably, by the filth they eat, but

few are actually deformed. The men average 5 feet 8 inches in height, and owing to their thinness of build look even taller; and they are active and quick in their movements. Many of the women are of diminutive stature, and their husbands treat them with great brutality. The knocking of a woman senseless with a waddy is a punishment to which the husband resorts on the slightest provocation, or when he is in a surly temper.

The largest fish in the Darling is the Murray-cod which sometimes weighs 60 lbs., and quite frequently over 40. It is the shape of a cod-fish with a spotted skin, and is esteemed greatly by the colonists for its delicate flavour. The blacks catch it in a hand-net which they enter the water to manipulate; but it bites freely at a bait, and affords excellent sport. The best baits are grasshoppers, a large hymenopterus fly and its larvæ, which is found in abundance on the river-banks, and earth-worms.

Birds have suffered greatly from the guns of the squatters, but they are still very numerous on those parts of the river which are farthest from the townships and stations. Parrots and cockatoos are there in great variety, and ducks and rails at one time swarmed on the river, and on every billabung and water-hole in the district.

One of the commonest cockatoos on the Darling is the rose-breasted (*Cacatua roseicapilla*), which is of a light grey colour with a beautiful crimson breast and a white poll. The pale yellow-crested (*C. galerita*) and a black variety (*Calyptorhynchus banksi*) are also found on some of the reaches. The yellow-crested and the rose-breasted are sometimes seen in flocks which number thousands, and when they are all screaming together the noise is extraordinary. Bank's black cockatoo is not so numerous, and is local. Where it is found the flock seldom number more than a dozen to twenty individuals. It is not such a noisy bird as the white species. The cockatiel (*Callopsittacus novæ hollandiæ*) is also found in great numbers. Though the flocks are not so large as those of the white and grey cockatoos, they are more numerous, and as many as five or six hundred birds may sometimes be seen

together. The average number in a flock is about two hundred, and seldom fewer than one hundred. All these breed in the belts of timber which in many places line the banks of the Darling, and the aborigines, at the proper season (July to September) take great numbers of the young birds to sell in the townships, and it is seldom that one enters the house of a colonist, in country or town, without being greeted by the screams of one or more cockatoos or parrots.

It seems to be generally thought that the food of cockatoos and parrots in a wild state consists entirely of fruits and seeds. This is a mistake, and it is interesting, in the light of the acquired habits of the kaka-parrot of New Zealand, to know that nearly all the Australian parrots feed largely on animal food. Cockatoos may often be seen with large beetles in their claws, biting off the elytra and legs previous to swallowing the bodies. They eat insects of all kinds, and on several occasions I have seen cockatoos robbing the nests of other parrots, and of small birds. Quarrels and fights between birds of different species of this family seem to have their origin in this habit. I have certainly, on one or two occasions, seen small parrots valiantly defending their nest-holes from the attacks of cockatoos. I have also seen cockatoos pitch in swarms on the carcasses of sheep and cattle which have died on the plains; but I think that this was to search for the larvæ which were abounding in the carrion.

A very abundant parrot on the plains, often found at a great distance from water, is the ground paroquet (*Geopsittacus occidentalis*), which I have found scattered thickly over large tracks of country. It does not, however, assemble in close flocks. It is a quarrelsome bird, and will chase and drive other small parrots from its feeding grounds. It breeds on the ground in the midst of thick tufts of herbage, does not make a regular nest, though a few bents of dried grass may be arranged round the slight hollow where the seven to nine eggs are laid. The Australian love-bird (*Melopsittacus undulatus*), a species well-known as a pet in England, is another common bird

of the Darling region; and is similar in habits to the ground paroquet. It lives on the plains in scattered flocks feeding on seeds and small insects, particularly ants; and like the last species, breeds on the ground, laying the same number of eggs; and though they are rather smaller than those of the ground paroquet, it is difficult to distinguish the nesting-places of the two species.

All these parrots are completely or partially migratory —the distance and time of their migration depending on the wetness or dryness of the season, and the consequent scarceness or abundance of food. It is at the time of migration that the largest flocks of cockatoos are to be seen. I feel sure that I have seen as many as 10,000 of the white species in a single flight; and a grand sight they presented to the bird-lover's eye. How the ground paroquets migrate I do not know; but I suspect, with some reason, that they depart in small parties, and mostly at night-time.

As it is impossible to notice all the birds of the Darling district I must be content to mention but two more here. Quails are numerous, and conspicuous owing to their frequent quarrels with the ground paroquets. These latter birds try to drive them from their feeding grounds, and the quails are valiant in defence of their rights. The result is that the two birds are not found on the same spot, but whenever one kind tries to invade the territory of the other the squabbles are incessant and vicious. Both parrots and quails occasionally lose their lives in the contests.

One of the noblest birds found on the Darling is the large and beautiful stork (*Mycteria australis*). It seems to be the most gregarious of the Australian herodiones; forty or more being sometimes seen together. It is often as much as five feet in length; and may often be seen searching the half-dry water-holes for fish, on which it preys to a great extent, but small mammals of the rat kind, rat-kangaroos, lizards, and an occasional snake, are also devoured by it.

This stork is in the habit of rising in parties of ten or

a dozen to a vast height, so that the birds appear as mere tiny specks; and after wheeling and evoluting for ten minutes or a quarter of an hour, flying off in a straight line presumably to some distant feeding ground. The nests of these birds are placed in trees at no great distance from the ground. I have seen them not higher than twenty feet; and few are built in tall trees. The nest is a large platform of sticks, pretty well covered with dead rushes and long bents of grass; and the nests of a small flock are built in the same neighbourhood, though perhaps not very closely together. Twenty or thirty nests may occupy a mile of the tree belt, though they are quite as often placed in trees a long way from the river, but always near a swamp, billabung, or water-hole.

The smaller, but not less beautiful, white-heron, (*Ardea flavirostris*) is also found on the Darling, congregating in small flocks which seldom exceed twenty individuals. Solitary pairs are frequently met with. This bird also builds on the tops of low trees. The nest is only a loose platform of sticks, twigs, and roots, and the young are almost invariably four in number.

CHAPTER VI

MOUNT KOSCIUSKO AND THE AUSTRALIAN ALPS

THE Australian Alps cannot enter into competition with the European giants whose name they have borrowed, but they are possessed of a beauty which is all their own, and cannot be eclipsed by the more exalted ranges. Mount Kosciusko, the highest mountain on the Australian continent, is only some seven thousand feet above sea-level; but for abruptness and wild grandeur of scenery, not even Mont Blanc can excel it. Though only seven thousand feet in total height, it has a precipitous face which is over two thousand feet high.

The ascent of Kosciusko is a trying one. The ground is exceedingly rough, much encumbered with fallen timber, and full of deep rocky gullies which must be climbed through, or avoided by detours which are too laborious to be undertaken by any ordinary mountaineers. Indeed both time and labour are saved by climbing the gullies. It is a climb, for these gullies are so precipitous that they first have to be descended into as into a pit and then climbed out of on the opposite side at eminent risk of neck and limb. They are all too wide to be bridged, and yet are so narrow and deep as to be often grave-like in appearance. There is always a dense growth of bush in the bottom of them, and on the sides wherever the shrubs can find a root-hold, while above there is a forest of huge trees thickly laced with creepers and underwood—quite different from an ordinary Australian forest. Masses of rock, exceedingly rough and jagged, litter the gullies and sides of the mountain, and block the way so effectually that, without the assistance of a guide who knows the

ground, many days will probably be lost before the explorer finds an accessible passage. Both the axe and the pick are required to clear the path, and ropes and a ladder, if not actually necessary, will be found most useful aids to a successful ascent. A mass of rock twenty or thirty feet high may be climbed over with the help of a rope and short ladder in less than a tenth of the time it would take to work round it. Even with the assistance of a good guide, and every imaginable accessory of the mountaineer, I do not think it is possible to ascend Kosciusko in a shorter time than two or three days, supposing the explorer to start from one of the stations which are now tolerably numerous near its base. I have ascended it three times, taking from five days to a week to perform the journey; but then my object was not to do the feat in a given time, and there was no hurry at any point of the journey. Twice I had companions with me, but on the third and last occasion I had but a single blackfellow attendant, a most useful man, who could climb like a monkey, and thoroughly understood the work required from him, and though I should be sorry to be thought of an unsociable nature, I must say that I think that dangerous rock-scaling parties cannot be too small. Where there are several members of the party, they cannot all be of the same powers of endurance, nor all have the same steadiness of head, and the progress of the more active climbers is delayed, and their danger increased by the necessity there is of looking after the weak and timorous ones. One man with a determined object in view, with a single reliable attendant, is far more likely to succeed than a large party. As to the mutual help afforded one to another by a party of four or five, since my first mountaineering experience I have been strongly of opinion that it is the weak and nervous who require the help, and they cannot, therefore, be otherwise than a source of danger to the active members of the party. On a picnic excursion, with enjoyment as the sole object of the expedition, it is reasonable that the strong should make sacrifices to the weak; but on ascents with deeper purposes in view it is not unreasonable to

leave behind everything and every person that is likely to spoil the expedition. Where pleasure only is the aim, it is absolutely wrong to run dangerous risks.

Besides ascending Kosciusko, I have spent several weeks in exploring the gullies and recesses about its base, and am consequently fairly well acquainted with the country in its neighbourhood. My starting-point was a stock-rider's hut situated about twenty miles south-west of the mountain—the side which, in my opinion, is the most accessible.

The base, and sides for quite two-thirds of the height, are covered with forest trees of large size, many of them at least a hundred and fifty feet high. For ages these have been growing, living their day, dying and falling in interlaced confusion, quite undisturbed by the interference of man, and consequently there is, in many places, a mass of prostrate trunks barring the most likely routes up the mountain side. Sometimes this fallen timber is so rotten that it can be easily cut away ; but often it must be climbed over, or crept under, both expedients being accompanied by danger. Some of the masses are so dense that the incautious traveller may get lost in the maze, and waste many hours of valuable time before he finds his way out ; and in climbing over the prostrate mass there is always the danger of a decayed trunk giving way beneath the feet, and then a nasty, if not a fatal, fall may be the consequence. There is also some danger from poisonous snakes which are pretty numerous on all sides of the mountain.

The diamond-snake (*Python spilotis*) is both numerous and large in size on the lower slopes of Kosciusko ; and I once slipped down unpleasantly close to one of these dangerous creatures, which, on being killed, was found to be seven feet long—a foot longer than this species usually measures. Diamond-snakes are found as high up on the Australian Alps as the limit of trees—that is generally to the top of the range ; but Kosciusko, and some few other high points are without vegetation on their summits. On Kosciusko the tree-limit is marked abruptly, and there is only a narrow band of herbage between the forest line and

the bare rocks. Pretty mosses grow among the rocks, one of a bright flame colour being particularly conspicuous. Insects, among them moths and butterflies, are found beyond the forest limit, and the lyre-bird, like the diamond-snake, is found as high up as that limit. Owing to the dense nature of the forest and brush it is more often heard than seen; and it is singular that a bird which, here at any rate, cannot have been much persecuted, should be so shy: for notwithstanding all my precautions I found but few opportunities of watching its movements on Kosciusko.

The top of the mountain, for the upper two thousand feet, is bare rock. A few minute mosses and lichens excepted, there is no vegetation; and the ground is usually covered with snow. This, however, in summer-time, often entirely disappears. The cold at this elevation, although sufficient to destroy vegetable life, does not seem to be very great. The blackfellow who accompanied me complained a little of it; but I did not even feel the need of extra clothing.

The top of the mountain is a plateau, and on the north and north-west the sides form perpendicular walls, down one of which I lowered a stone tied to a sounding line a distance of 1768 feet before it found a lodgment. Below is a forest, on the top of which the eye rests as on the billowy foliage of the enclosed valleys in the Blue Mountains. But here there are no cascades tumbling over the precipice. In the tremendous chasm there are several rushing torrents which form the head-waters of the river Hume. This river further down to the westward becomes the Murray, the second great river of Australia; which, it is generally assumed, is named after a Scotch official bearing this time-honoured name. But it seems more probable that it is an abbreviation of the native exclamation "murrey! murrey!" meaning great astonishment or surprise, or something very remarkable; a term they certainly used on first viewing this and other great rivers of the continent. There does not seem to be any official record of the river having been named after Sir John Murray, who was a former Colonial secretary. Rightly or wrongly the Murray is now *the Murray*, is so spelt in documents and

books and on the faces of maps, and the Murray it will ever be; but let it not be forgotten that its native name truly describes what it is to man and beast in this scantily watered land; it is the "Happy-Happy," for in this sense the word is often used.

The scene from the top of Kosciusko is both beautiful and imposing. The forest with which the sides of the mountains are on all sides thickly clothed prevents the explorer from obtaining a view of the surrounding country until he is close to the top, when the magnificent view bursts suddenly on him. Judging from what can be seen here, one would imagine Australia to be a thickly wooded country, which we know is not the case. From the top of Kosciusko, however, the country for an immense distance has the appearance of being clothed densely with graceful festoons of foliage. The actual distance to which the vision can range I do not know. Certain landmarks, however, are not less that fifty, sixty, and seventy miles away; and it is probable that the extreme horizon is quite thirty miles further off. In the neighbourhood of the mountain, huge chasms loom in the misty depths below; so deep and narrow that only dimly can they be discerned to be clothed with luxuriant verdure, in the form of tall trees, and feathery shrubs and brush. Ferns of gigantic size, nettles equally remarkable for great development, and various species of grass-trees, give an exceedingly light and graceful appearance to the vegetation of the valleys; and the immense crags of broken rock add a wild beauty to the general scenery.

Some of the streams which form the head-waters of the Murray (here called the Hume) can be traced out on the flat plains which form the boundary of the scene, and the occasional scintillation, in the bright sunlight, of other waters can be seen; but on the whole the landscape lacks that inexpressible charm which a large river generally gives to scenery. No lakes, or broad sheets of water, are visible; nor are cascades noticeable: though scanty falls of great height are found in other parts of the Alps and in the Blue Mountains. Torrents rush along the bottoms of

some of the gullies which score the sides of Kosciusko, but none of them form falls of any great height or volume; and none roll over the most precipitous cliffs.

In no part of Australia are there waterfalls to compare in volume and grandeur with those of other continents; but many of those that do exist are remarkable for their great beauty. Some descend many hundreds of feet into gloomy chasms, which are too narrow and confined to be correctly described as valleys, and yet have scarcely volume enough to weigh against the strong mountain winds, which often blow them into remarkable looking veils of spray. Some, indeed, are beaten, by successive dashings against the rock, into spray so fine that they only reach the gully a thousand feet below as a shower of rain. In summer these cascades dry up entirely and cease to be until the winter rains renew their babbling lives.

The melting of the snow on the tops of those peaks of the Australian Alps where it finds a lodgment for a few months in each year, must and does form torrents; but these are never of any great size or force; and on Kosciusko the torrents all run in the direction of the lesser slopes of the mountain. Occasionally they fall a few feet into gullies, making charming scenes on a small scale; but these are so hidden by thick forest and masses of a bamboo-like shrub that it is only rarely that a good view of them can be obtained. Speaking conjecturally, I should say that there is not a cascade in the mountain that discharges more than a dozen tons of water per minute; and in the dry weather probably all are exhausted for a time; or, at most, trickle over the rocks as runnels.

Among the broken rocks at the bases of the Alps wallaby are numerous—I should say except where the colonists have nearly exterminated them—but they do not ascend the mountains to any great height. I have never seen any at a greater elevation than twelve or fourteen hundred feet.

But it is, probably, the smaller "native cats," "native mice," etc., that are the most interesting mammals of these

mountains. The whole region abounds with mouse and rat-like animals that belong to very different genera to those small rodents. The pouched-mouse, for instance, has superficially so much the appearance of a mouse that its popular name is quite justified. The pouched-mouse (*Sminthopsis murina*), and another species which I have not identified, are very abundant in the Alps, ascending to the summits in most places, a height of at least four thousand feet above the sea. Usually described as insectivorous, they are really as omnivorous as the common European mouse, and I have caught many of them in traps baited with cheese, bacon-rind, and similar baits. They will also nibble bread, but if an attempt is made to feed captive specimens on such diet, they soon die. They will eat meat both raw and cooked, preferring the former, and are very fond of fat, particularly mutton-suet. In a wild state they eat most kinds of insects, but coleoptera and slugs form the bulk of their food.

The pouched-mouse varies its habits with its locality. In the mountains it harbours about fallen and decayed timber, being very timid and shy. It is to a great extent nocturnal, especially in the open plain country, where it lives in the bush. It is more active than the European mouse, makes a neat nest of grass lined with fine fibres, and has from five to seven young at a birth, which are not placed in the nest, but carried in a pouch which is large compared with the size of the animal.

The native cat (*Dasyurus viverrinus*) is found at the base of the Kosciusko, but is a scarce animal in most parts of the Alps. This curious and handsome little animal is of a darkish colour spotted all over with white blotches. It does not at all resemble a cat. Except that it is a marsupial, it is much more like a pole-cat, especially in its habits. It is a fierce little animal, and those that I have kept were dangerous pets, and never reconciled themselves to captivity. It is a thorough beast of prey, and attacks any animal it is strong enough to overcome, the exotic rabbit excepted, and it is singular that the latter pest appears to have no enemies in the country. The usual

prey of the native pole-cat (as it should be called), consists of birds both small and of considerable size. For though it is arboreal in habits, it leaves the trees at night, and neglecting the swarms of rabbits, seems to make straight for the homesteads of the squatters where it, or at most a pair of them, show their truly weasel-like instinct by destroying fowl after fowl. Sometimes as many as twenty head of poultry are killed in a single night, apparently for the sake of their blood, which always seems to be sucked from the body. Not many of these animals are caught in traps; and they work so silently that, unless they are specially watched for, the unfortunate squatter or farmer is seldom made aware of the fell work going on in his hen-roost.

In the trees they destroy many young birds; and pigeons and parrots are surprised in their nesting and roosting places, and captured in great numbers. This I have clearly traced by means of the feathers and such remains as the feet, beaks, and bones. The head is usually eaten, or at least the brains and eyes sucked out. The allied animals, known to the colonists as 'possums, also suffer greatly from their more powerful kinsmen; and an occasional tree-snake falls a victim to these ravenous "cats," but though the opossums eat insects, I have never found any evidence that the cats do so, and I think they are altogether too fierce and ravenous to concern themselves with such small prey. It is a wonder and a pity that the native cat does not take to preying on the rabbits which abound in so many parts of the country; but, as I have already hinted, none of the Australian carnivorous animals have as yet taken to making serious attacks on them. I have never seen an eagle or a hawk with one in its talons; the snakes and the dingoes may destroy a few, but I have only met with scant evidence that they do so. Ferrets and weasels have been imported into the country from England for the purpose of thinning their numbers; but these ferocious little animals preferred attacking the poultry they were brought to protect, and proved only an addition to the nuisance. Poultry are kept in large

numbers by the colonists, and are a great attraction to all kinds of marauders—human and animal.

The opossum, so called, is the common phalanger (*Trichosurus vulpecula*) of naturalists: but this term is also applied by the colonists to the phascologale, which is a much smaller animal, not larger than the European brown rat.

The common opossum (*Trichosurus*) is found abundantly in nearly every part of the continent; and is often considered by the colonists to be only second to the rabbits and kangaroos in the mischief it does them. Sometimes swarms of them, evidently performing a partial migration in search of food, appear in a district; and at night-time they leave the trees, and run over, and into, everything about the nearest homesteads. Into the barns and open windows they find their way, eating and destroying in an extraordinary way every kind of fruit or grain food they can find. Though, like the rabbit, they never seem to drink, they eject a foul-smelling fluid over corn and bread and whatever they touch, rendering everything quite uneatable, and arousing the squatters' ire to an extent that only a 'possum and a new chum can provoke it. Whatever mischief is done in house or barn is always laid on the back of a 'possum, or a new chum. Organised shooting parties are therefore assembled when the 'possums become troublesome; or the station blacks are paid so much per dozen for their skins. Still, like the rabbits, they thrive under persecution; and they are one of the few Australian mammals which show no sign of diminished numbers, in spite of incessant slaying and trapping on the part of white men and black.

The 'possum is roasted and made into pies, like the rabbit, and eaten with avidity by the lower classes of whites, and by the blacks; but it is not equal in flavour to the latter animal. If not habitually omnivorous, it certainly is not a strictly vegetarian animal, and its diet is made up largely of portions of any eatable articles that come in its way. Like rats and mice, it will nibble boots and other leather articles, and make unsightly breaches in cheese and

bacon, two articles that are often eaten by animals that are supposed to live on a quite different class of viands. Indeed there are few small mammals that will not eat cheese at least; and even insects that are described as entirely vegetarian will eat it greedily.

The 'possum has a powerful set of teeth which it is by no means slow to use if carelessly handled; and it is a singularly destructive animal for its size. Like rats and mice it nibbles holes in woollen articles, and as several invade the house together, the amount of damage which is sometimes done is almost incredible; and until I had the clearest proof of the fact, I could not believe that 'possums were the culprits.

In the daytime these animals are not seen in any great numbers, though there are often some wanderers abroad, especially if the day is dull and cloudy. They are rarely seen on the ground and appear to leave the trees only to go on marauding expeditions. Sometimes, on clear nights, they may be seen scuttling about the branches in large numbers; and this is a time that is not neglected by the blackfellow. He is an adept at ferreting the opossums from the hollow boughs in which they take refuge on the least signs of danger. He seems to know by instinct exactly where the 'possum lies, and cutting the dead wood away from behind it, whips it out by the tail, and with one smart blow kills it before it has time to turn and bite. The gins, or native wives, are often employed whole days in this work, which is a profitable one to them, for the bodies of the little animals supply a relished food, while the skins are far more valuable than those of rabbits, and are an object of barter with the white man, bringing in return many coveted luxuries to the savage, of which pipes and tobacco are not the least.

The "native-bear" (*Phoscolarctus cinereus*) called by the blacks the koala, is the largest and perhaps the most curious animal found on the slopes of Kosciusko to a height of about two thousand feet. It is a couple of feet in length, and of thick-set, bear-like appearance. It also greatly resembles a sloth, of which animal it seems to take the

place in the Australian forests. It is as harmless as a sloth; and no instance of one attempting to defend itself ever came to my notice; though if it chose to bite it could inflict an ugly wound. Sluggish and harmless, it resembles the sloths closely in habits as well as in appearance, and its food is similar—leaves, and leaves only, I believe; and it will not accommodate itself to any other kind of food. The leaves of the gum-tree it must have, and no others are an acceptable substitute for them: consequently, when a constant supply of these leaves is not obtainable, the animal cannot be kept in captivity—indeed, it never thrives in confinement.

In its native forests, it is only seen singly or in pairs. Probably it pairs for life, and they never wander far from each other. When one only is seen the other may be lurking in a hollow-tree within a few feet of it. The two are often seen near the top of a tall tree, and present a singular sight. They frequently remain motionless for several hours at a time, and are never active. Though they come to the ground it seems only to be for the purpose of travelling from one tree to another. They never drink, I think; at any rate, they can exist without water, and though, from the scientific naturalist's point of view, they differ greatly from the sloths, their habits, attitudes, and ways are entirely those of sloths with this one exception—they do not hang back-downwards from the under sides of boughs.

When surprised on the ground in the forest, the native-bear makes some slow and awkward attempts to get to the nearest tree. In this it always fails—escape is impossible, so slow are all its movements. Resigning itself to its fate, it seems to entreat, by a series of grotesque movements of its great pluggy head, the commiseration of its captor. It groans and sighs, and sways and contorts its body in an apparent agony of entreaty, which, pathetically comical as it is, is so suggestive of pleading for mercy that few persons, except blacks and cruel boys, have the heartlessness to hurt it. Perhaps the meaning of all its gestures are mistaken by man. I scarcely think so

myself. It is certain that the animal is not an intelligent one; yet I am not prepared to admit that its low type of brain-organisation is responsible for this, and in its peculiar habitat it is not without a certain intelligence that shows it to be well fitted for its mode of life. It chooses only the largest trees, where the leaves are in greatest luxuriance, in which to live and feed; and it moves from branch to branch with adroitness, never stripping more than a small part of the leaves from any one portion of the tree. These leaves it does not eat as it gathers them, but they are stored in its large cheek-pouches which are capable of holding more than a pint. The food is consumed while the koala is sitting quietly in the top of the tree. The red-gum is the species it prefers; but it is always a gum-tree of some kind in which it feeds and rests.

The sharp and strong claws of the koala seem to be of no use to it except for pulling down the branches upon which it cannot trust its weight. It is one of the most harmless of all animals, and never makes even a show of defence against either men or dogs, while it is quite as tenacious of life as the sloth. I have witnessed some cruel scenes when unfortunate koalas have fallen into the hands of blackfellows. "Him no good waddy; so cut heart out." The meaning is that it is useless to strike a koala with a waddy (club); so the poor animal is ripped open while alive and the heart pulled out.

The female has only one young one at a birth, which is of very slow growth. At the proper stage of development, she transfers it from her pouch to her back, where it clings so firmly, and digs its claws into her woolly coat with such vigour, that the lower part of her back is often rubbed not only hairless, but sore also. In this way she carries her young one until it is about half-grown, when it begins to shift for itself.

The young koala is much esteemed as an article of food by the blacks, who climb the trees and knock mother and young one together from the branches. Though they often fall more than a hundred feet to the

ground, they are never killed outright, and sometimes not even disabled. It is left to the knives and hatchets of the gins to complete the cruel tragedy.

The implacental group is, to me, an exceedingly puzzling one. The various families of which it is composed clearly represent genera of the placentals which are far removed from them. It is not enough to say (as has been done) that the Australian kangaroos take the place of deer, the wombats and koalas that of sloths, etc. These animals seem to me to have an affinity, though certainly a very distant one, to the families of placentals they are supposed to represent on the Australian continent. The kangaroo is not a deer, and no naturalist, in his right senses, would attempt to prove that it is one; but, admitting evolution, it is easy to believe that it might have been evolved from a specialised member of the deer family.

A careful dissection of the koala has convinced me that it is a specialised wombat; and though it differs as much from the sloth as the kangaroo does from the deer, I think that both wombat and koala may, by and by, be found to belong to a parallel branch of the Bradypodidæ.

CHAPTER VII

THE COLONY OF VICTORIA, AND THE EASTERN RANGES OF MOUNTAINS

THE mountains which in north-east Victoria are called the "Alps," bear different designations in the westward parts of the range. They are known locally as "The Grampians," "The Pyrenees," etc., etc. These mountains, which are all parts of one continuous range, afford some of the most delightful scenery in Australia. To the north and west it is still, to a great extent, unspoiled by undue thinning out of the timber; though it is to be regretted that much unnecessary destruction of trees has taken place. It is an old-settled colony, and there is very little ground within its boundary lines that has not been thoroughly explored; still a fair percentage of its total area is in a state of "unspoiled nature." Every bird or mammal that is worth powder and shot has had its number decimated, and more; yet there remain in this colony of Victoria a greater variety of species than in any other district of equal area; and the wallaby-shooting of some localities is sufficiently celebrated to draw sportsmen from other parts of the continent, from America, and even from the old country.

The eastern range of mountains nearly everywhere present that remarkable cliff-like outline which is the characteristic of Australian mountains. The plains are walled in with cliffs that are often much more than a thousand feet high; and so precipitous that it is impossible to climb them; indeed it is often possible to drop a stone from the top on to the level ground below.

Wood is abundant on the mountains, and there is a

park-like sprinkling of it on the plains—there was much more before the squatters destroyed it to make room for their sheep. The grass is excellent, and as green as in the English meadows; and probably this is the best watered part of Australia. No wonder, then, that it is thickly strewn with the homesteads of squatters and stockmen, homesteads that often rival the stately homes of the old country aristocracy in splendour of architecture, and are fully equal to them in luxury of appointments. There is a fad in this district for imitating the mother-country in all things; and British trees are planted, and British shrubs cultivated, to an extent that often completely deceives the eye, and renders it impossible, by sight alone, to detect the difference between the mansion on the Australian sheep-run from the old country family-house of which it is, as nearly as possible, a replica.

The bases of the mountains are much littered by masses of rock, great and small, which must have rolled down from the heights above; yet it is often difficult to realise that this is the correct explanation of the origin of some of the masses. Huge rocks, weighing hundreds and perhaps thousands of tons, and surrounded by numerous smaller masses, lie in positions which they could not possibly occupy if they fell from any of the existing heights. Some of these rocks are half buried, apparently to the extent of one or two hundred feet, in the ground upon which they lie; and generally they are half-hidden in a thick growth of brambles, brake-canes, and ferns, with many sweet-scented wattle-trees and other flowering shrubs. It is here that the "rock-wallaby" love to lurk, and so closely do they lie that they may often be literally kicked from the shrubs before they will fly. It is fine sport is this wallaby-shooting, and the man who wishes to enjoy it fully does not use dogs to flush the game; rarely indeed are dogs used at all. The sport is very hard work, for one is constantly climbing in and out of holes and small deep gullies formed by the massing of the loose rocks, and the vegetation is so thick that here and there it is impossible to force a way through it.

If not the commonest, the most important on account of its size, of the rock-wallabies is *Petrogale xanthopus*, and it is unique among the wallabies in having a ringed tail, alternately marked with buffish colour and dark brown. The whole animal is conspicuously marked with brown, grey, black, and buff. This wallaby is from 2½ to 3 feet long, and the tail is 20 inches in length. It is a graceful and active animal, and is generally found in herds of about ninety in number.

In the plains to the north of the range the hare-wallaby (*Lagorchester leporoides*) is the commonest species. It is from 18 to 20 inches long, and is also a pretty and graceful little animal, with great leaping powers. It probably clears a space of at least twenty feet at a bound when flying from dingoes or dogs; but it is impossible to make accurate measurements under ordinary circumstances. The colour of this wallaby is a sandy-red, which, in some districts, renders it almost invisible at a short distance. It lies very close in the scrub; but when it is once started it leaps across the plain in a straight line, and at a pace that prevents any but the best dogs from overtaking it. The female will stick to her young one until all chance of escape is lost. Then, if it is heavy, she will take it from her pouch, I think rather with a view of urging it to escape than from a desire to abandon it, and save herself. The wallabies, unlike the larger kangaroos, never attempt to defend themselves; but an incident that occurred while I was exploring this district led me to think that one species at least seemed to be provided with a special organ of defence.

Many of the squatters, though ignorant enough of science themselves, were quite in sympathy with my taste for investigating the marvels of animated nature, and often drew my attention to matters of interest that they had noted among the wild creatures which surrounded their dwellings, and from them I gleaned items of valuable information.

One of these gentlemen sent for me to look at a curious wallaby which had been sent to him from North Queensland. I soon recognised this little animal as the spur-tailed

wallaby (*Onychogale unguifera*). The remarkable point about this wallaby is that its tail is furnished at the extremity with a large spur or claw, which in the specimen I examined was more than an inch in length, thick and heavy and sharp-pointed. I do not know that the animal uses this as a weapon of defence; but it struck me, taken in conjunction with the great length of the tail, which was as long as the animal's entire body from the snout to the root of the tail, that it might be able to strike a very sharp blow with it, and I cannot think of any other use for such an appendage. If it is not a weapon of defence, I can only suppose that it is the remnant of some defunct organ which the animal has no longer a use for, and which is gradually devoluting.

This animal was two feet in length, and, as I have said, the tail was as much more. Of the habit of the species in a wild state I could glean no information. My friend's pet was in good health, cheerful, and disposed to be playful. It knew him, and was not at all shy, and was kept in an enclosed garden where it helped itself to what vegetation took its fancy. This diet was supplemented with grass and herbage brought from the meadows; but it was not a large eater, and did but little damage in the garden. During the heat of the day it liked to remain hid in its hut, but at sun-down it came forth and was very lively. It could leap sixteen or seventeen feet in a straight line, but could not clear obstacles that were more than two or three feet high. It was not afraid of the station dogs, permitted persons it knew to touch it, but was timid in the presence of strangers.

The native porcupine is plentiful in the range mentioned above, though, on account of its peculiar habits, it is not often seen by persons who do not specially watch for it. This, the *Echidna aculeata* of naturalists, is another of those extraordinary animals which are peculiarly Australian. It is generally considered to be one of the least developed of all mammals, and its low type of brain is pointed to as conclusive evidence of its want of intelligence. On the surface of this organ, in the echidna, there

are not so many of those convolutions which are found on the brains of the highly-organised and intelligent animals. If we are to be guided by this fact the echidna is much below the birds in the scale of creation, though it is extremely bird-like in its skull-formation. But both the echidna and the platypus (for which see Chap. VIII.) are far more intelligent animals than is generally thought. In their cases brain development has little to do with mental power. Both are extremely cautious animals, and this one fact, if it stood alone, would prove them to be possessed of a considerable power of thought, but it does not by any means stand alone. Animals of a low mental development are always lacking in the gift of self-protection. It is in the lowest forms of animal life that the natural gifts of mimicry and protective-colouring are found in greatest perfection.

The echidna is a burrowing animal, and its power of quickly burying itself must certainly be as great as that which is reported to be possessed by the American armadillos. The animal is always found on rocky ground in the hills and never on the plains. I have caught them on the highest plateaus of the Alps, the Sierras, the Grampians, and the Pyrenees—that is, at an elevation of not less than four thousand feet, and in some spots of perhaps nearly five thousand feet; but I never found the least sign of the animal's presence in level country. In such ground there are few, or no, soft places; and indeed the echidna dislikes damp spots, yet if it is suddenly come upon its captor must be quick in seizing it, or it will be out of sight in a few seconds. If surprised at a distance from its burrow, it does not run for that shelter, but proceeds, at once, to bury itself where it is. The head and shoulders are under ground by the time an active man can run a distance of thirty or forty yards; and then such an exertion of strength is required to draw it back that I have frequently feared I should tear the animal asunder in doing so. But it is tough, and after being subjected to a tug that could not have been less than fifty to sixty pounds in force, appeared to be quite unhurt.

On capture these little animals show signs of much fright. Their heart can be felt violently beating, and they emit their fæces, and also squeak with a characteristic bird-like or chirping note; but there is never the least attempt at self-defence. Indeed they are quite incapable of defending themselves, for there are no teeth in their remarkable bird-like beaks. More harmless creatures than echidnas and duck-bills do not inhabit the earth. They hurt no creature but the minute animals which form their natural prey, and do absolutely no harm to the squatter or the agriculturist.

In captivity, if properly treated, and provided with their natural food, they will live a long time, and like the duck-bills, give clear evidence of recognising their masters —another proof that they are not lacking in intelligence. Their food consists of insects and earth-worms, some of the latter being of considerable size. They consume so many ants that they are frequently called ant-eaters—a name that is, perhaps, considering the extensile character of their tongues, correctly applied to them; but they differ greatly from the true ant-eaters, and ants form only a portion of their food. More correctly the echidnas (there are two species in Australia, one in Tasmania, and another in New Guinea) take the place of the ant-eaters in Australia, as the koalas do that of the sloths, the kangaroo that of the deer, etc. In Australia, as I have remarked, nearly all classes of the placentals are represented by implacental families.

So rapidly can the echidna burrow that a minute is amply sufficient time for it to put itself completely underground, and that in ground which is so hard that a man can dig into it only with difficulty. Unlike the rabbit, the echidna takes care to conceal the entrance to its burrow, which is placed under a mass of tangled roots, or amongst a thick tuft of ferns or grass. There are always at least two holes to each burrow, and sometimes three or four. It is very difficult, therefore, to obtain the animal by digging. At the bottom of the main burrow, which is seldom a less distance than forty feet from the entrance-

hole, and six, eight, or even ten feet beneath the surface of the ground, the echidna makes a nest which greatly resembles that of the platypus, or duck-bill. It is composed of fine fibres, grass, and feathers, with sometimes tufts of wool or fur. The wool and feathers must be gathered from the ground, and in various nests which I have examined consisted of sheep's wool, and the fur of kangaroos, wallabies, and the small rat-like marsupials which abound in the mountains. Much of this fur or wool belong to animals which are only found on the plains, and unless it was blown to the mountains by high winds, it must have been fetched by the little animals from immense distances.

The former may possibly be the right explanation; for the animal is a bad walker, and cannot escape by running. The hind feet are used most awkwardly, the nails being turned backwards, and the ankles only placed on the ground, causing the animal to appear as if crippled when viewed from behind. It does, however, travel long distances from its burrow; on such occasions it is frequently captured. It seems to be very dull of hearing, and when surprised, if its captor runs quickly upon it, it may be seized before it has time to bury itself. Though its spines look formidable they do not seem to be intended by nature to serve as a defence. At any rate, the echidna may be handled with more freedom than the European porcupine can be.

The nest is not at all like that of a bird, but is a mere bed of materials on which the egg is laid. I have not been able to ascertain if the eggs are incubated; and, if so, for how long a period. They greatly resemble those of the duck-bill, and are about the size of those of a thrush. One, I think, is the normal number laid annually; but sometimes there are two, which is just the reverse of the case with the duck-bill, which usually lays two, but occasionally one only.

These eggs are far more avian than reptilian in character. The shell is parchment-like, quite white in colour, and tough in texture; but the yolk exactly resembles that in birds' eggs. The young, like those of the duck-bill, are

blind when hatched, and remain so for a considerable time, though I am unable to definitely state the period of their blindness. It is not less than six weeks; and when recently hatched the animal is without a beak, the orifice of the mouth is round, open, and cannot be closed; and for some time after coming into life the young one remains firmly attached to the nipple of the mother; and, as in the case of most, or all, of the other Australian implacentals, it means death to it if it is separated from the parent by force.

Like the duck-bill, the echidna is furnished with spurs on the hind feet. These spurs are sexual, being found on the males only, and the accepted explanation is that they are used during the breeding season by the rivals which contest the possession of the females. This explanation is not, I think, very satisfactory; but it is the best that can be put forward at present. I have never witnessed any combats between the males of this animal, and its timid nature is strong presumptive evidence against its ever showing a combative disposition. I must make the same remark concerning the duck-bill. There is a canal down the spur, which was formerly supposed to be a channel for the exudation of a poisonous fluid. I have not been able to discover such a fluid; wounds inflicted by the spur on other animals, and on men, are not hurtful. Quite possibly the weapon was formerly poisonous, and may have been an effective defence to the animal. The fact that the female is not furnished with them is a difficulty in the way of the acceptance of this theory; but occasionally the male echidna is without them: I have taken a specimen that had but one, which was on the right foot, and several of these animals of both sexes have been found which had not the normal number of toes. So that we may reasonably suppose that the animal is still actively in process of evolution.

Southward of the mountain range the country of Victoria is most English-like. Orchards of apples, cherries, and plums abound; there are hedges of hawthorn and hazel, and sometimes fences of loose stones, reminding one of the North country of the mother-land. Houses are

built on the English plan, covered with ivy and exotic creepers; and the domestic animals are nearly all of the old country types, though occasionally one is amused at the incongruous scene of an emu stalking about amidst common poultry, or a couple of tame kangaroos hopping about the lawn. Not improbably, too, the visitor may be saluted by the screaming of several parrots and cockatoos, which enjoy semi-liberty in the trees which shade the front of the house. English trees abound everywhere—in the garden, field, and by the roadside; English sparrows swarm in many places, and other old country birds are to be found where protection is afforded them—rooks, robins, blackbirds, thrushes, and many finches—all the descendants of a few pairs which have been imported by some home-sick enthusiasts. English game-birds abound on many estates, and the red deer, fallow deer, and other animals may be found by the diligent naturalists; while in no part of Australia is that pest, the wild rabbit, more abundant.

The pasturage of this country is the richest on the continent. Many squatters own 50,000 or 60,000 sheep, and a few have 100,000 or more, besides cattle and horses in proportion. Victoria is the country of the "wool-kings." Huge fortunes are made here: while northward, in Queensland, the stockman reigns supreme, and can show almost as many head of cattle as the southern squatter can of sheep. Both classes of men depend entirely on "natural-feed" for the support of their stock. Hay is not made—in any great quantity, at any rate—and turnips, for sheep feeding, are quite unheard of. I do not know if swedes would grow in this country—many European vegetables will not prosper in Victoria. The nature of old country plants is often changed by planting in this land, as Australian plants are by transference to European soil. In a few cases vegetables and fruits are improved by the change.

North of the ranges described in the first portion of this chapter—in the back-runs—the country is still of a rich character, and except in the extreme west, as well-watered as any Australian country. The grass is beautifully

green, and when it is well cropped by sheep or cattle, as short as in any English meadow. Daisies and buttercups are lacking, but the brilliant yellow of the latter flowers is imitated by that of a ranunculus which grows in myriads; and other attractive and brightly coloured wild flowers may be found in great variety by the diligent collector.

Large tracts of these northern plains are marshy during the winter season, and harbour vast numbers of wild-fowl, especially in those districts, mostly on the banks of the rivers, which are covered with rushes. The most notable bird among these is, perhaps, the pied-goose (*Anseranas melanoleucas*), which looks as much like a huge crow as a goose. The beak, in the first place, is not of the typical anserine shape, but is bent, or arched; and the feet, also, are abnormal, being furnished with strong claws, and only partially webbed. The bird spends much of its time perched on low trees, and does not often enter the water. Yet it is fond of marshy places, and preys on such reptiles and insects as are found in damp spots; particularly it feeds greedily on the fish and eels which are found in the partially dry river pools and water-holes.

Not only is this bird crow-like in outward appearance, but its notes also are hoarse and croaking, resembling those of a raven. Sometimes it is very noisy and calls incessantly for a long time. At other times its hoarse cries may be heard as it wheels, in small flocks, through the air It does not fly in ranks like geese in general, and seems to migrate from one part of the country to another according to the scarcity or abundance of food in a district. I have never seen it in large flocks, but there are always a number together—perhaps a dozen or twenty, and sometimes nearly a hundred. If a hawk should happen to seize one, the remainder of the flock combine to attack it, which they do with many fierce cries and great hubbub.

At a homestead near Dunkeld the owner had imported several birds from England, and turned them loose in his grounds in the hope that they would breed and establish themselves. Amongst these were four or five pairs of robins and some larks. The larks disappeared, but one

pair of robins built in a bush near the house, and successfully reared a family of five young ones.

Warblers and parrots and pigeons are so numerous in all parts of Victoria that it is impossible to notice them here in detail. Probably the abundance of woods account for their numbers, for Victoria, on the whole, is a well-timbered colony, and what native wood has been destroyed has in a great measure been replaced by European and American timber-trees.

CHAPTER VIII

MORE REMARKS ON THE FLORA AND FAUNA OF VICTORIA AND NEW SOUTH WALES

BEFORE leaving the south-eastern parts of Australia there are some animals and plants which must have notice, as they are either entirely confined to those regions or, at least, have their headquarters there.

Foremost among these is the platypus, or duck-bill, almost as remarkable a creature as the echidna, but one which is generally better known to naturalists. My remarks concerning it therefore may be brief.

The duck-bill is a rather larger animal than the echidna, a fine specimen being at least a foot and a half long, and weighing at least five pounds. One uncommonly large male which I captured was twenty-two inches long, and weighed five pounds eleven ounces. Though the duck-bill is a larger animal than the echidna it lays smaller eggs. These are usually two in number, and are a trifle larger than those of a house-sparrow.

Like the echidna, the duck-bill makes burrows of a great length—often forty feet long; but not very deep down in the earth. These burrows are always made in the banks of rivers and pools, but never where there is a perceptible current in the water. The still, pond-like reaches of the smaller streams are the favourite haunt of the duck-bill, and there is always more than one entrance to its home. One, and perhaps two, of these entrances, are situated a foot or two under water; the other is well concealed under roots or amidst tangled grass.

The surface of the brain of the duck-bill is almost

entirely without those convolutions and furrows which are found on this organ in animals of highly-developed organisation, and which are considered by anatomists an indication of superior intelligence. But with the monotremata this indication is not to be relied on, for notwithstanding that the echidna has, superficially, the highest type of brain, it is the least intelligent of the monotreme family, while the duck-bill is by no means lacking in intelligence, though it has the lowest type of brain of all known mammals.

The echidna is a solitary animal, a pair, at most, being found together; but the duck-bills congregate in small flocks of twenty to sixty or eighty individuals, the number living in company seeming to depend on the size of the pool they inhabit. In very small pools, not more than twenty or thirty yards across, there may not be more than six or eight duck-bills, but there are sure to be others in the neighbourhood. Sometimes, when a large pool is well-stocked, there may be a few duck-bills in all the smaller ponds for a distance of many miles along the river—these pools being generally separated in summer by stretches of perfectly dry bed. Never, under any circumstances, is a solitary pair of these little animals found living alone. There are sure to be more than one pair in a pool, and many others in the water-holes close at hand.

The duck-bill though a curious, is, I think, a pretty animal. Its fur, of a fine deep brown colour, is soft and velvet-like to the touch, and very thick, and its small eyes are bright and expressive. Like the echidna it is a perfectly harmless creature, and absolutely incapable of aggression. The spurs of the males are large and strong, considering the size of the animal, but they are certainly never used for defensive purposes. Their use is a great mystery. I am almost sure that the duck-bills, as well as the echidnas, pair for life; the sexual contests, therefore, which are supposed to be the objective of these weapons, are not likely ever to take place; besides, though I have watched them very closely, I have never seen anything like fights or quarrels amongst them. They are very peaceable animals. Some few creatures prey on them—

snakes chiefly; but as the females are not provided with spurs, these appendages can scarcely be intended for defensive purposes. There are glands at the bases of the spurs, but I could never discover any fluid, poisonous or otherwise, and my theory that these spurs are in process of evolution, or devolution, is probably the correct explanation of their presence on the animal.

The duck-bill is a strong swimmer, and this is a singular circumstance considering that the animal inhabits small bodies of water only, and carefully eschews currents and running water generally. In swimming it assumes the ordinary recumbent attitude, but it has a habit of floating motionless for a long time at a stretch, and then it assumes a vertical position with its head and beak held upright. In this position duck-bills have a very extraordinary appearance, like the tops of so many small posts appearing above the surface of the water. The slightest noise is sufficient to cause them to disappear instantly by sinking beneath the surface of the water, where they swim to the submerged entrances to their burrows and take refuge within.

This habit is well known to the blackfellows who, having alarmed a colony of duck-bills and driven them to their retreats, proceed to dig them out with their roughly constructed paddles. The course of the burrow is ascertained by driving a pointed stick into the ground; and when the direction of it is satisfactorily ascertained, holes are dug at intervals of four or five feet until the nest chamber is reached at a distance of three or four feet beneath the surface of the ground, where the animal is found curled up with fright. It makes no attempt to escape, and one sharp rap on the head kills it, for it is not so tenacious of life as the echidna.

The skeleton of the duck-bill is very reptilian in general characteristics; the arrangement of the bones being, in several parts, similar to that found in the skeleton of a lizard. The young are suckled through lacteal-pits and not by means of teats; but this peculiarity is common to many of the wallabies and kangaroos as well as to the monotremata. They are nearly always two in

number: never more, but sometimes I have captured females with but a single young one clinging to them.

The duck-bill feeds on fresh-water crustacea, worms, and slugs, and does not eat below the surface of the water. The food is first collected in the cheek-pouches with which the animal is provided, and seems to be consumed when it is at rest in its burrow; or, perhaps, when it is quietly floating in the vertical position. In captivity a small quantity of food is sufficient to keep them in health, but they must be kept well supplied with water.

The distribution of the duck-bill is not wide on the Australian continent—certainly not extending to a tenth of its entire surface; and in many parts it is a local animal, being found perhaps on the upper reaches of a river, but never on the lower parts of the same stream. I have found it on the Upper Darling, near Caidmurra, but this seems to be about its northern limit. Eastward I could find, or hear, nothing of it beyond the line of the river Murray. In the interior of New South Wales, and of Victoria, it becomes gradually scarcer, and the Darling probably bounds its range in that direction. It is not so nocturnal an animal as many naturalists have stated it to be. Probably they have been misled by its extreme shyness, which causes it to be very chary of showing itself during daylight.

It is a lively and playful animal, and the spectator who takes care to keep himself concealed and remains perfectly still, will be amused by the many pretty gambols of the duck-bills, both in the water and on the banks of the streams. The duck-bill never wanders from the immediate neighbourhood of water. In time of drought they gradually collect in the larger pools; and at such times, under pressure of necessity, they may be found on the banks of lakes, and in running water.

It is a remarkable coincidence—if it is a mere coincidence—that the range of the native-robin (*Petronia phœnicia*?) is identical with that of the duck-bill. This small bird is a robin in size, liveliness, and familiarity with man; but its plumage is most brilliant, and so strongly

contrasted that the arrangement of colours are more like the effect of art than the work of nature. The breast is vivid scarlet, gradually shading to rose-pink on the abdomen. The back, wings, and tail are deep black with white stripes and markings, and the top of the head is also bright white. The colours are very distinctly marked, and separated from each other with decided lines; and this fact, with the bird's restless and amusing habits, draw the attention of the traveller to it. Like the European robin, it is fond of visiting the neighbourhood of houses, and if encouraged and fed, it will become so tame that it will hop close to the feet of the squatter and his family. Like the English red-breast it is protected by the common consent of the people.

Another remarkably pretty little passere is the pheasant-tailed finch (*Stipiturus malacurus*). The tail feathers of this tiny creature resemble those of the lyre-bird in being incompletely webbed. They are, in fact, mere skeleton feathers. The two central ones are more than twice the length of the bird, and when it runs quickly among the scrub, or through the bushes, it looks like a mouse. It is very quick in its movements on the ground or amongst the branches of shrubs; but it flies weakly with undulating, jerky movements. It has a soft, pleasing note that can scarcely be called a song, and though it is tame in the bush, and will permit a close approach to it, it seldom goes near the homesteads of the squatters.

Yet another very common finch in most parts of New South Wales and Victoria is the black fan-tail (*Rhipidura motacilloides*), with very similar habits to the last species. It runs about the ground looking more like a mouse than a bird when in motion, stops suddenly and shakes its tail to and fro rapidly with a lateral motion, then on again till a fly attracts its attention or comes near enough to be captured, when it gives a little hop, captures its prey, and resumes its amusing run. It has a lively chirp and several call-notes, but no song.

All these finches lay light-coloured spotted eggs, the nests being built of fibres, grass, hair, and moss, lined with

wool, hair, and feathers. Sheep's wool is frequently found incorporated in their nests, or used for the lining, and one fan-tail's nest that I found was lined with dingo's hair. The nests are placed in bushes or shrubby trees, without much attempt at concealment, are all neatly made, and much resemble each other in general appearance.

Several Australian butterflies and other insects are identical with European species; but when I drew the attention of an English entomologist to this fact, he suggested that these are imported species, the chrysalises having, in the first place, been sent out from the old country in bags and bundles of seeds, etc. This is a very reasonable explanation, and is probably a correct one. Among the species which are quite common in many parts of New South Wales I may mention the following: the white admiral (*Limenitis camilla*), the meadow-brown (*Epinephele janira*), the purple hairstreak (*Thecla quereus*), copperstreak (*Polyommatus phleas*), the skipper (*Pamphilea silvanus*), the tortoise-shell (*Vanessa polychlorus*), and some others which I am not able to so clearly define. The cosmopolitan painted-lady (*Pyrameis cardui*) may be indigenous to Australia, though I think this improbable. The spike-winged butterfly (*Erycina aulestes*) and a few others are certainly American.

English grasshoppers (*Meconema varium*) and the great migratory locust (*Pachytylus migratorius*) sometimes make their appearance in menacing numbers; but whether the latter comes over the sea or breeds from imported eggs or larvæ I have not been able to ascertain. That the English grasshoppers, of several species, are imported, is certain.

Of native insects several are as peculiar to the country as are the marsupials and monotremes. Not the least remarkable is the huge giant-moth (*Zelotypia stacyi*), which often measures as much as nine or ten inches in spread of wing. The moth with wings closed, and when sitting on a branch, measures from four to five inches long. The general colour of the body and under wings is light reddish, with some dusky and black markings. The upper wings

are obscurely tinged with several hues—brownish, reddish, whitish, with an ocellated brown spot on each of the wings. The insect cannot be properly described in words, the colouring is altogether so undecided and peculiar.

It is not a scarce moth, but it is very local, and it is difficult to find, and to capture when found. The usual way of obtaining it is to procure the larva, and await its development. By this means a perfect specimen of the moth is obtained. The larvæ harbour in hollow stems of the gum-tree, and are difficult to find. The best plan is to hire a blackfellow to climb the trees and test the branches. The acute aborigine is an adept at finding hollow places, and the creatures of all kinds that harbour in such retreats, and he will procure a dozen larvæ before the novice can discover one. They are seldom found at a less height than sixty to eighty feet from the ground, and the moth itself flies very high, never coming within reach of the net of a collector standing on the ground. It is absolutely necessary to climb the trees they frequent to effect a capture, and much patience must be exercised, much disappointment endured, if the moth hunter would be successful in his pursuit. Some poor persons turn an honest penny by the capture and sale of these moths, which are sought after as curiosities. From ten to twenty shillings are demanded for good specimens; but perfect insects, such as a naturalist requires, are seldom to be obtained in this manner. The body of the moth is so large that it must be cleaned and stuffed, or the specimen soon becomes worthless.

The giant-moth flies swiftly as well as at a great height. It may be seen shooting over the tops of the tallest gum-trees, and the higher the collector ventures to climb, the greater is his chance of effecting a capture. He should keep close in to the trunk, and remain motionless until the moment comes for him to use his net. He will find it better, however, to rely on larvæ for specimens, as owing to the size and strength of the insect it is almost impossible to capture it uninjured.

Giant-moths are seldom seen abroad until after mid-

day, but they fly freely during the afternoon, and until a late hour at night. They seem to be fond of moonlight, and on bright nights may be seen in great numbers, but shooting about in scattered array. They are never seen in flocks; and they appear so large, and move so swiftly, that by unpractised eyes they are often mistaken for birds; especially as the movement of their wings produces a loud whirring sound, like the flight of a bird.

The larva of this remarkable moth is a large grub of a light yellowish-green colour with various brown and red markings, of which it would be futile to attempt to give a description in words. The native blacks eat this and other large grubs; and for a short clay pipe and an ounce of tobacco, one of these men, or his gin, will find and bring to the collector several good larvæ. The hollow branches in which they harbour should be cut bodily off, and kept in a warm, dry place. The hollow is formed by the larva itself, which feeds on the wood: it is usually fourteen or fifteen inches long, and the larva freely moves about within it. The chrysalis is also very large—fully three inches long.

Regarding the distribution of this insect I must write with some reserve. Reports that I have collected from stock-riders and the natives are contradictory; and this is all that I can state with certainty. I have never seen or heard of the moth south of the meridian of Sydney. It is found near St Albans, and stray insects have been taken not more than thirty miles, in a straight line, north of Sydney. In Maitland, Durham, and Brisbane counties it is abundant, though in many local spots it is unknown. Thence northward I have seen and heard of it at intervals as far north as the Clarence River. It approaches pretty close to the sea-coast, but does not seem to have been able to cross the mountains known as the Liverpool, New England, and Macpherson, etc., ranges. At any rate I feel safe in asserting that it is unknown in the interior of New South Wales. I have heard that it has been seen in South Queensland, but could obtain no evidence of the correctness of the report.

The giant-moth is a gum-tree haunting species; and where gum-trees are not plentiful there are no moths. The blue gum seems to be its favourite tree; but it also breeds in the red gum and others. Of course, the branch attacked by the larva is killed; but I have found no evidence that these moths cause a serious destruction of timber, like that occasioned by the ravages of some European species; indeed it is but seldom that I have obtained two specimens of the larva from the same tree, and the moth, as I have already stated, is not gregarious.

The giant-moth is not the only giant native of the regions I have been writing about. In Victoria, some fifty miles north of Melbourne, and near the township of Fernshaw, are "the world's big-trees," which completely eclipse the Californian Wellingtonias. It is strange that these trees should have existed undiscovered for so long so near one of the New Continent's great capitals—stranger still that they have attracted so little notice that the American pretenders are still, popularly at least, permitted to enjoy a title they can no longer justly claim. Three hundred and seventy-six feet cuts a poor figure before five hundred and twenty-two! these being the reported heights of the tallest Wellingtonia and giant gum respectively. I think that the latter figure can be proved as the height of one at least of our big gums. I have measured one huge trunk as it lay on the ground, and found it to be four hundred and fifty-one feet, and there was still several feet of this mighty fallen one standing over its root.

These huge gums are a wonderful sight and should be seen by every visitor to the country. And why should they not be? People cross a great continent to view the Californian pines—the Victorian gums are within five or six hours journey of the Melbourne hotels! Yet, strangely enough, the Fernshaw gums attract no great regard in their own country. The gum is regarded, like the kangaroo, the 'possum, and the rabbit, as a nuisance; and these big trees are rapidly being exterminated. The land they grow on is good land, with twenty or more feet of vegetable soil in many spots, and it is wanted: and so

the gums are given as victims to the axe and the firebrand.

As statements of the unfamiliar, and particularly statements of great size, are generally received with scepticism and ridicule by the ignorant, it will be well to give here actual authenticated measurements. I have never seen a big gum which measured as much as five hundred feet; but I believe those who say they have made such measurements. I have measured with my own hands several trees which exceeded four hundred and forty feet. The average height of the trees in the Fernshaw gum forests is from three hundred to four hundred feet. As late as 1890, thousands of trees of four hundred feet might have been obtained. I have not seen them since that year. They were then being felled and destroyed wantonly.

The girth of these trees varies much, and does not always bear a true relation to their height. Eighty-eight feet is the greatest girth I have measured at a height of five feet above the roots. A circumference of from forty to fifty feet may be taken as the average of the biggest trees. Planks of about two hundred feet long have been cut from some trees, but the timber is not held in much esteem.

The varieties of the gum-tree are very many in number; but they mostly bear local names which are quite different from their ordinary specific names. Iron-wood, black-wood, blood-wood, etc., etc., are all varieties of the gum; and there are blue, red, and white gums, and some others. The gum they all exude is valueless, or nearly so. It may have a small medicinal value; but it cannot be used as a cement, or for any of the ordinary uses to which the true gums are put.

As is well known, the eucalypti shed the outer coat of their bark; but it is a mistake to assert that they do not shed their leaves also, though they are evergreens. When a gum forest is in process of bark-shedding, it presents a most ragged and untidy appearance: strips of the bark of a light tan colour hanging from the trunks, some of them thirty feet long, and waving weirdly in the passing breeze.

I disliked walking in the gum forests at the bark-shedding season—the trees seemed to be in mourning, and there was scarcely any animal life to be seen. The strips of bark fall to the ground, where they make a great litter, and render walking laborious work. It is only the thin outer bark which is shed. The real bark is, perhaps, the most useful part of the gum-tree to the Australians: that is, of some varieties of it.

It is by the process of barking that most of the trees are killed. The bark is stripped off in sheets of five, six, and seven feet square, and used for roofing houses, building sheds, and similar work. After being barked, the tree usually stands for five or six years, or perhaps a little longer; but it is killed and soon falls. If the impatient squatter or locater wants the land for immediate use, he sets fire to the forest, and then there is no limit to the mischief that may be done. It is against the law to destroy the trees; but the law is openly defied in this matter. The utility of clearing the land is generally acknowledged; and juries will seldom convict an offender for forest-burning, and never for "barking."

The undergrowth of the giant gum forest is composed of tree-ferns and a mass of lovely flowers, and is a sight that is only second in interest to that of the great trees. There are no gloomy shades in the forest. The trees grow quite a hundred and fifty feet high, and often much more, before they shoot forth branches, and the foliage is so thin and feathery that the light is not excluded, and flowers flourish beneath them in great variety. It should be mentioned that all the finest of the trees grow in deep valleys and gorges amongst the mountains; and those which die from natural decay must soon rot away, for there is very little fallen timber lying about.

The village of Fernshaw is in the heart of the big-tree region, and is a convenient stopping-place for those who wish to visit it. Fernshaw, with its whitewashed cottages and narrow country lanes, has a decidedly English appearance. Fowls, ducks, chubby children, and an occasional pig, wandering in the road, remind the English visitor of

the old country; but the huge trees that rise abruptly from the environs of many of the houses are quite unlike anything English. European flowers crowd the gardens of the cottages; and the seeds of many of these have flown into the forest, or been carried thither by birds, and found a suitable soil in which they have rooted and prospered. Pansies, sweetwilliams, fuchsias, evening-primroses, and others which are certainly not indigenous to the country, have been found at spots which, so far as I know, are at least twenty miles distant from the nearest houses. Some of these flowers are slightly changed, especially in colour, from their natural characteristics, and some are much developed and improved by the change of habitation.

The wonders of the native flora found in the Fernshaw forests, and in the country for many miles around, cannot be here described. Remarkable form is strongly contrasted by brilliancy of colour in almost every genus of plants found here. Wattle-trees, perhaps, attain the perfection of their development, filling the air with their delicious scent, while the eye is gratified by sight of immense trailing masses of the *Tecoma australis*, a large trumpet-shaped flower, which climbs the trunks of the gum-trees to a great height, and hangs in graceful festoons between the huge trunks. Other climbers show clusters of curious bell-shaped yellow flowers (*Billardiceas*, I think), and others a bright-blue blossom. The colours of all the flowers are as remarkable for great brilliance as are those of the birds which harbour in these giant forests.

Palms are numerous; and many of them, like the mammals, are remarkable for abnormity of form, so much so that no person, having ever seen them, could fail to, at a glance, recognise an Australian palm; but as the palms of the north part of the continent are the most remarkable, I will defer noticing the genus for the present.

The lyre-bird is found in the forests about Fernshaw. It was abundant twenty or thirty years ago, and, I think, may still be pretty numerous in the interior of the woods; but, naturally a shy bird, it has been rendered very cautious by continual persecution.

The birds which are sure to attract a stranger's notice first are the splendid cockatoos and parrots. One of the most gaudy of these is the scarlet lory, which is abundant enough to be seen every day close to Fernshaw.

Scarcely less gorgeous and beautiful than the lory is Leadbeater's cockatoo (*Cacatua leadbeateri*), several parties of which I have seen on the outskirts of the forest; but this species is far more numerous and seen in larger flocks in the open country to the eastward.

CHAPTER IX

A RAMBLE IN SOUTH AUSTRALIA

THERE are some desolate spots in South Australia—portions of the coast of Spencer's Gulf, for instance. On the other hand, some of the scenery, even well up in the interior of the colony, is as beautiful as any that can be found on the continent. I have made several long rambles into the heart of the colony, and beyond the settled portion of it. Journeys, perhaps, I should call them; but as they were made under easy circumstances, either with pleasure as the chief object, or with prospecting parties that were in no hurry to complete their surveys, the term rambles may be justified.

The start was always made from Adelaide, a colonial capital which, for elegance of general appearance and fineness of individual buildings, is second to none on the continent. One of the best railway lines in the country has its terminus in Adelaide, and a fine prospect of considerable stretches of the country may be had from the windows of a railway carriage; but the conditions of my journeyings were such that, being encumbered with several pack-horses, I usually performed the whole journey by road.

South Australia promises to be, at no distant time, a great mining country. The minerals are numerous, and many of them are of such excellent quality that they are renowned all over the continent, and are in demand in many distant places. Some of the most important quarries are in the neighbourhood of Adelaide, and are mines of wealth, more reliable and profitable than gold

mines. The Mintaro slate quarry is the most important in Australia; and visitors to it never fail to be delightedly told by the miners that the largest slab ever quarried was taken from this quarry. It measured 15 feet long, 9 feet broad, and 3 inches thick—truly a sizable slate—but I know not whether the boast that it is the largest ever quarried can be substantiated. Certainly Mintaro slates are extensively used in all parts of Australia.

But even in its mines Australia is peculiar, and differs from other continents; and one fault of mines and quarries in this district is the erratic way in which lodes and strata are arranged, and the remarkable way in which they sometimes "give out," or cease to yield. One of the most notable instances of this peculiarity was experienced in the case of the Burra-Burra copper-mine.

In the year 1845 the Burra-Burra district was a back-country sheep-run. Only a few adventurous shepherds had penetrated so far inland, and these men lived with a crook in one hand and a musket in the other. For although the wandering blackfellows were few in number, they were viperish in disposition, and many cruel tragedies occurred. "Kidney-fat," too, is a temptation that the wild blackfellow cannot resist, and perhaps many of the murders would have been prevented if the shepherds had not resented too fiercely the loss by theft of a few sheep. The old class of shepherds was an uneducated one, and often drawn entirely from the convict establishments, and vendettas between them and the blacks were very prevalent on many of the back-runs where there were no magistrates and police to maintain order.

One of these outlying shepherds, who had penetrated further afield than his mates, was astonished to perceive what looked to him like a huge inverted cauldron of copper half buried in the earth. He reported the matter and the country was prospected, and numbers of these inverted cauldrons were discovered studded over the face of the country, sometimes lying far apart, often clustered close together. They looked, according to the description of an eye-witness, like huge bubbles of copper that had welled

up in boiling. So extraordinary was the sight that it is said many geologists came from Europe and America to witness it, and none could give a satisfactory theory of so strange a formation.

Miners came from Cornwall, the copper was worked, and for a few years the mines proved to be a very profitable concern, but the lodes puzzled the miners. They had never seen any like them before, and, indeed, declared that they were wholly erratic, and if they existed for any distance underground, were so deeply buried and hidden that it would be mere waste of capital to search for them. The surface copper was soon exhausted, and at the time of the "gold rush" (about 1851-52), the miners deserted almost in a body. Work was afterwards resumed at the mines, but at the time of my visits (between 1892 and 1899), they seemed to be exhausted, and work had entirely ceased. I had not the gratification of seeing one of the remarkable bubbles which had attracted so much attention from a former generation.

Burra-Burra is the name of a district rather than that of a town. Collectively it means the whole mining city of the Burra-Burra creek or river; but each party of miners had a township with a designation (usually national) of their own. Thus the Scotsmen had an Aberdeen, the native Australians resided at Kooringa, and so on, the various townships being seldom separated by a greater distance than a dozen or twenty yards.

The country between Burra-Burra and Adelaide is now the most populous in the colony, and also the most prosperous, and consequently the larger animals and birds have become comparatively scarce—killed by the gun and net, or driven away by the rapid advance of the agriculturist, for the land is being brought under culture, and the corn-grower is fast superseding the wool-raiser. Profitable as the latter business is, corn-growing is more so, and land that was formerly thought to be desert waste is now known to be excellent for grain crops.

Nothing is more disturbing to the fauna of a country than the operations of the cultivator, except actual

destruction by means of the gun and trap, and both fauna and flora are generally greatly modified, and in some degree changed, when tillage breaks up the forest covert and the open plain. The numbers of wild animals and birds are always much reduced, and some species exterminated. Perhaps the flora suffers even more than the fauna when a new land is brought under cultivation.

The distance by road from Adelaide to Burra-Burra is about a hundred and ten miles, and in that space I passed through several districts in which I rode miles without seeing more than a few scattered birds. Formerly this tract of country swarmed with black swans and other water fowl, including the beautiful french-grey heron known as the native companion. Three times did I ride between Burra and Adelaide without seeing a single heron. Once or twice I saw small flocks of swans flying at a great height towards Spencer's Gulf, where, in days past, they assembled in thousands. These birds must have been journeying from some distant feeding-ground, for it is a very unusual circumstance for swans to fly high. Ducks are plentiful on rivers and water-holes which are not too near a human dwelling; but they are wild and difficult to approach, and have learned to fear the gun. The report of a firearm is sufficient to send all those within the radius of a mile flying to some distant retreat, and the wild-fowler seldom gets a second shot at the same spot.

The European sparrow has established itself in the Burra district, and I noticed it at several other places on the road from Adelaide, where also it is as common as in an English town; but whether it has found its way up from the capital city, or has been taken thither by the amateur acclimatiser, I could not discover. There it is, however, as pert, saucy, and as much at home as I perceive it to be in the city of London. Used to the bird as I have been from the days of my boyhood, I have always looked upon it as an Australian native, and have scarcely, until recent years, been able to understand the surprise that many emigrants to Australia evince at finding it so firmly established in the new land. Though most emigrants

have heard of the rabbit pest, and are surprised at not meeting with immediate evidence of the destructiveness of that little rodent, few are prepared, on their arrival, to be greeted by the chirping, impudent, feathered friend that they have been so intimate with in their native land.

Other English birds are sometimes met with here, and in other parts of Australia ; but, as a rule, they are confined to particular estates, where they have been turned loose and protected by the owner. Blackbirds and thrushes seem to have prospered best, but on one estate the robin seemed in a fair way to establish itself; and on several large farms in Victoria the skylark has made itself sufficiently at home to breed. There are some enthusiastic bird-lovers in the country who would give a large sum for a few pairs of English nightingales could they be procured ; but I believe, though many attempts have been made, that a nightingale has never been landed alive in Australia. Even the robin will rarely endure confinement sufficiently long to enable it to be imported to our continent. Once safely there, however, it seems to be able to find abundance of acceptable food.

On the alluvial flats near Spencer's Gulf, the cornfields are often crowded with scarlet poppies ; and dandelions, buttercups, and daisies, large and small, abound on the grasslands, both artificial and natural. The seeds of these flowers must have been brought to Australia in corn-seed bags or sticking to the wool of sheep. That seeds are transported from country to country entangled in the wool and fur of animals has been proved beyond dispute. Several Spanish plants came to the colonies imbedded amidst the wool of a flock of merino sheep ; and other instances have been noted by colonial naturalists. Sometimes serious consequences follow importations, accidental and otherwise. I have heard a story of a Scotch gentleman who had much trouble with his neighbours through his attempt to raise a crop of genuine Scotch thistles. I am not sure that European plants have yet obtained a sufficient hold upon Australian soil actually

to oust any native species, except very locally; but no doubt some Australian plants are menaced by the introduction of foreign genera; and, in my opinion, the domestic and other imported animals will ultimately materially affect certain families of the native flora. Man, above all other agents, is effecting great changes. Here, as in all the settled parts of Australia, are many spots, sometimes entire estates, that might, if superficial appearances only are considered, have been cut out of an English county and bodily transplanted hither. Everything, from the house in its patch of hawthorn-planted park, to the gooseberry bushes and gilliflowers in the garden, is English. The horses, the dogs, the ducks, geese, and fowls, are all of British origin if not of British breed, and the owner of all these does his utmost, on Sundays at least, to make himself thoroughly English, in a silk hat and black frock-coat of perfectly Oxford Street style and cut.

Though so much of the land has been cultivated, and more, at least, improved, there are long stretches of salt-bush scrub within a short distance of Adelaide. When this scrub is in flower (that is in winter time) it presents a by no means unpleasing scene; nor is this scrub any evidence that the land is bad. Much really good land is covered with salt-bush, and sheep readily eat and fatten on it; patches of it, therefore, are often left on the sheep-runs, and in time of drought it is very valuable, as it lasts long after the grass has failed, and no degree of aridity will kill the roots. Many of the Australian birds nest among it; and I have noticed that the destruction of the salt-bush generally results in these birds forsaking a district.

The celery-pine (*Podocarpus asplenifolia*) is a remarkable-looking tree which is sure to attract the attention of a stranger. It is very plentifully distributed on most of the hills in this district, especially on those eastward of Adelaide, covering some of the highest to their very tops —that is over four thousand feet above sea-level. Nearly all the telegraph-poles in this and the adjoining colonies

are made of trunks of this tree, and it affords valuable timber for many other purposes.

On the flat plains beyond the hills there are many miles of "mallee-scrub." This singular plant is a species of eucalyptus, though if one tells an ignorant squatter or stock-rider that the mallee plant is of the same family as the "gum-tree," he is stared at in blank astonishment. Such is the fact, however.

The root of the mallee is a large, flat, woody disc, often more than a yard across, and some eight or ten inches thick. It is called a "scab" by the colonists, and from the underside of this scab a great number of small fibres, or rootlets, penetrate the ground to a great depth—until they find moisture, indeed—so they are sometimes at least a dozen feet long. From the upper side of the scab sprout a number of cane-like sticks, or stems, reaching a height of fourteen or fifteen feet, and sprouting, at the top, into a dense cluster of leaves. The ground in a mallee-scrub is thickly covered with these strange, disc-like roots; and each "scab" is so firmly held to the ground by its numerous rootlets, that, as I have proved by actual experiment, the strength of a dozen oxen is not sufficient to tear one of them up.

The rootlets of the mallee-scrub contain a great quantity of moisture; and where it abounds the bushman cannot perish of thirst. If the rootlets are dug up, broken into small pieces, and placed to drain into a billy (or small tin pan), a goodly supply of drinkable fluid may be speedily obtained.

Mallee-scrub is tiresome country to travel through, the numerous scabs being a great nuisance to a horse, and a still greater annoyance to a bullock team, and the monotony of the scrub is very depressing to the mind of man. There is absolutely no break in the general appearance of the country, one scab being as like to another as two pins are.

Mallee-scrub is characteristic of what is called desert country. It does not grow near rivers or on well-watered plains, and I have ridden through a hundred-mile patch of

it without finding a single creek or water-hole, but there is always water at no great depth beneath the surface of the earth. The roots must have moisture or the plant cannot exist, and on digging, water is always found at depths varying from eight to fourteen feet, and this water is invariably of good quality.

Wallaby abound in the mallee-scrub, and so do several species of lizards, particularly that remarkable creature the "spiny devil" (*Moloch horridus*), which looks like a nightmare phantom, but whose harmlessness is in direct contradiction to its horrible appearance. Its monstrous form and stout spines are protective rather than actively defensive; for as it squats on the ground it resembles some dull-coloured prickly vegetable mass of the cactus kind. In hue, also, it harmonises well with the soil on which it is found, and probably hundreds would be passed by a possible enemy before one was discovered to be a thing of life.

In size and bulk generally, the spiny devil is about equal to a large toad; but, as is the case with many other reptiles, individuals sometimes grow to an abnormal size, and I have taken them weighing nine ounces, the average being about five. The whole body, including the short stumpy tail and the thick limbs are covered with short, fine-pointed, conical-shaped spines. Two of these spines form formidable-looking curved horns on the head; and the lizard must be handled carefully to avoid a prick. It is certain that a snake could not swallow it; but I am inclined to think, as I have already stated, that its appearance is protective—that it is a strange case of mimicry, for there is an (apparently) fungoid growth in some parts of the desert region which, as it bursts from the earth, presents almost exactly the appearance of a spiny devil. Still more remarkable, I once saw the lizard feeding on this plant. If it forms a constituent part of the reptile's food, the strange armament of the latter is surely, to a great extent, a mimicry of the plant, though it must be noted that the plant is not really spiny. It simply appears to be so until it is closely examined. While the lizard

lives partly on vegetable matter, it also consumes small insects, flies, worms, and grubs. It seems to feed sparingly, but on this point I cannot speak positively. It roams abroad at all hours of the day, crawling about in an apathetic way; but when alarmed it mends its pace and endeavours to escape. This it cannot do from man. It lives in burrows which are seldom very deep, and it can easily be unearthed. When captured it puffs with its breath like some other lizards, but it does not emit any cry, and makes no attempt at resistance. If placed on the ground it tries to escape; but after two or three such attempts it remains quiet, either simulating death, or waiting for the danger to pass away.

It is found singly, or in pairs, and sometimes a few—perhaps as many as five or six—will be found scattered about a small space of ground. I have never found more than one in the same burrow, and know nothing from personal observation of its breeding habits. If the hand is accidentally pricked, or scratched, with the spines when handling the lizard, no ill effects result. The wounds heal as quickly and cleanly as those made by thorns.

Other lizards, and animals which are usually thought to require moisture, are abundant in this arid scrub. But perhaps the ground and atmosphere are not so dry as they seem to be. I was surprised to experience frequent rainfalls in this scrub at a season of the year when no rain is expected in more favoured parts; and I heard from old settlers in the neighbourhood, that a considerable amount of rain constantly falls during the year. This has induced many small holders to clear patches of the scrub land to make orchards and market gardens, and these men seem to prosper well—perhaps better than some of their more pretentious neighbours. They all have wells of good water on their small estates, and there seems to be a good prospect of the entire district soon being parcelled out and cultivated. The wells never fail; and there is, no doubt, an abundant supply of water at a very few feet beneath the surface, which can be obtained in all parts of the desert. Indeed, in what is known as the Ninety-Mile

Desert, the Colonial Government has sunk an artesian well which has never ceased to yield a constant stream of perfectly pure water; and a great part of the district is a desert no longer.

On the lower slopes of the mountains, a little to the eastward of Adelaide, and on many of the low hills, grows that grand flower called by the natives the warryta, and sometimes by the colonists the Australian tulip. This, I believe, is the most westerly range of the shrub which bears it. It is not very abundant, and much mischief is done by persons who cut the flowers to sell in the city, where there is a brisk demand for them.

The plant, which is in danger of extermination in this district, is a low black trunk, with a great crest of large, coarse, grass-like leaves, something resembling the grass-tree in general form. From the tuft of leaves there springs a tall stem, at the top of which grows a huge cluster of vivid scarlet flowers. This is the warryta, and wherever it grows it is one of the most striking objects in the landscape—so striking and beautiful that, unfortunately, it is hunted for far and near, no Australian floral decoration being considered perfect without it.

There is also a very fine species of *melaleucus* growing in the Adelaide neighhourhood, which has beautiful scarlet blossoms; and I noticed that a large proportion of the wild flowers of this part of the country are of the same bright hue.

CHAPTER X

THE SPENCER GULF DISTRICT

PORT AUGUSTA, one of the most thriving ports of South Australia, stands at the head of Spencer Gulf; but it is, in my opinion, a place of far more interest to the mercantile man than to a lover of the picturesque. It is a flat, uninteresting-looking place, more remarkable for its huge piles of grain-bags, its store-sheds, and its wharves, than for anything else. The corn grown on an immense area of the adjacent country is shipped from Port Augusta, and grain trains are constantly arriving from the interior. There was a time when the corn was brought down to the wharves much faster than it could be shipped; the consequence was that enormous piles of bags were often to be seen heaped up on the ground near the water. One such pile that was shown to me was said to consist of fifty thousand bags of wheat, and I can well believe that this assertion was no exaggeration.

But though Port Augusta is a place of little interest, except to certain classes of men, there is much that is remarkable and beautiful in the surrounding country. The shores of the gulf are flat and muddy; but mountains of striking elevation and curious shape are in full view.

The old idea that the interior of Australia was an inland sea may not have been so wild a conception as it is now generally thought to have been. There are strong indications that, at a geologically recent date, the sea penetrated very far inland, perhaps nearly right across the continent, forming what may justly be termed an Inland sea. The water seems to have gradually receded, leaving behind

an immense salt marsh, of which Lake Torrens, other inland quagmires, and the shores of Spencer Gulf, are remains. Until improvements were made, and protective dykes erected, Port Augusta, and the scattered settlements near it, were in constant danger of inundation; and to this day wide stretches of the shore are horrible mud wastes on which no man dare set foot for fear of being engulfed. Some of those mud-flats are covered with reeds, but I found it impossible to penetrate far among them. Often I sank into the soft ooze above the knees, and more than once was in some danger of being embedded in the mud. So far as I could discover there were few inhabitants of these reed beds except ducks and black swans, and these are not nearly so numerous as they were a few years ago. They are shot in great numbers by the farmers and others; and the black swan, a particularly shy bird, seems to forsake a neighbourhood where it is much disturbed. In the quieter reaches of the gulf, and in remote bays, they still breed in considerable numbers; but in 1896 when my last visit to this district took place, a black swan was rarely seen anywhere near Port Augusta.

At Port Augusta the gulf has narrowed to a creek, and looking across it to the country on the opposite shore, one sees a range of hills flat topped, and horizontally striated near the summit ridge, as so many ranges in Australia are—a characteristic that hereafter will frequently be referred to—and the origin of which is clearly a puzzle to the geologists, their attempted explanations notwithstanding. That which puzzled Darwin seems to also puzzle more modern professors of the earthy science; at anyrate I have not yet seen an explanation of the peculiar Australian mountain forms which is quite convincing.

Turning the eyes southward and eastward more lofty mountains are seen, some of them at a great distance; and these seem to be of a quite different formation. It is nearly always so with Australian mountains; rarely does there seem to be much system in their arrangement, indeed I may say no system at all. A jumble of small ranges, isolated mounts, and erratic groups, is the usual

arrangement of the elevated parts of this strange land. To give a reasonably lucid description of them, they must be described in detail.

In the immediate neighbourhood of Port Augusta there is absolutely nothing worth a line of description. There is not a tamer or more uninteresting tract in all Australia; and that will scarcely be wondered at when it is stated that most of the land was originally a mud flat. There is not a tree, shrub, or flower, or even a blade of grass, on this land that has not been planted there; or, at any rate, the few weeds that have found a rooting-place there have only recently come, seed-blown before the desert blast.

One of the most remarkable mountains in the district is a nearly detached mass which, correctly enough, bears this very name, "Remarkable." It is the terminal outpost of the Flinder's range, and is in full view of the road just outside Port Augusta, distant some thirty-six or thirty-seven miles. From the south, however, it is visible to a traveller nearly sixty miles from its base. On all sides except the east it is shut in by the lower wooded slopes of the Flinder's range. On the east it rises abruptly from the almost dead level of the plain, a precipitous wall of rock which, in most places, is nearly perpendicular. A few buttresses project from its face, which is also scared with many deep and rugged ravines; but it is only here and there that a clump of trees or bushes find it possible to obtain a hold for their roots. When there is rain, water runs down these ravines in fierce torrents; but I could not discover any permanent stream.

The wood on some of the hills has a singular appearance. It consists, mostly, of stunted miall bushes, which are scattered about at nearly regular intervals, giving the hill, from a distance, the appearance of a huge plum-pudding. Other hills are better clothed with timber; but many of them, like Mount Remarkable, are almost bare rock. The range, generally, is flat topped, but there are some sharp-pointed peaks. None of the trees on the hills are of great size, and the low ground is everywhere

covered with salt bush. In the interior part of the range are many deep gullies, and sharp and broken masses of rock are strewn about in great confusion. Near the township of Quorn, which is situated on the top of Flinder's range, at an elevation of about two thousand feet, there is a conical hill which is surmounted by two of these masses giving the outline of the mount a strong resemblance to the devil's horns, hence it is called "The Devil's Peak." The view from this peak is very fine, embracing an extensive stretch of Spencer Gulf to the east, and the plains to the south and south-east. Townships which are fully fifty miles distant, are distinctly visible through the beautiful clear Australian air.

The broken masses of rock often assume very fantastic shapes, and as is usual in such cases, bear equally fantastic designations. There is a small host of Devil's Peaks, Devil's Punch-bowls, and Devil's Horns in the Port Augusta district. Passing by these, I may mention the Cathedral Rock situated at the back of Mount Remarkable. The Cathedral is thought much of by the people of Port Augusta and the townships for many miles around; and it is a favourite resort of pleasure parties, the more so, perhaps, because a good deal of hard climbing is entailed in the reaching of it. It is a rugged mass embedded in the steep slope of a hill, and seems to threaten to fall headlong, ere long, into the ravine below. The situation is, I think, more remarkable than the rock itself, and further northward I have found several more singular masses. One of these, which was about half a mile in circumference at the base, and more than two hundred feet high (four times the dimensions of the Cathedral Rock) was notable for the number of ragged pinnacles which crowned its summit. Up this rock I contrived to climb about halfway, but the top seems to be inaccessible.

All these rocks, and the bare mountain sides, are everywhere covered with lichens and beautifully tinted mosses, which add greatly to the beauty of their appearance, but render the surface so slippery as greatly to increase the danger of scaling the sides of those which are

very steep. In the crevices the mosses cluster in tangled masses, and are usually intermingled with lovely coloured and shaped wild flowers in great variety. In the hills, as on the plains, the forest is nearly always of an open character, and offers no impediment to the traveller's movements.

Mount Remarkable rises about three thousand three or four hundred feet above sea-level (the base is but a very few feet above the surface of Spencer Gulf); and the Devil's Peak seems to be of not much less elevation. Both mountains are often enveloped in clouds, which float more than halfway down their sides, and both have occasionally shown a thick layer of snow on their summits; but the climate, generally, on the plains below is hot, which is the cause, probably, that several small townships and many lone homesteads have sought shelter in the gullies of the range, or close to the bases of some of the loftiest peaks.

The echidna is found in some parts of Flinder's range; but I could nowhere find or hear of the duck-bill in the Port Augusta district. There are traditions of the emu having been abundant once; but it is now rarely seen until the traveller gets much further north than the head of the gulf. The ubiquitous rabbit is not unknown, as many of the settlers will tell one with a rueful tone of voice; but in the mountains the rock-wallaby is by far the most abundant of animals, and yet it is a much persecuted creature. Rock-wallaby shooting is a favourite sport with all classes of colonists; and it is a sport. He who would make a good bag of rock-wallaby must exert himself to do so. The game lives in difficult ground, where the sportsman is continually climbing up or down, is very quick in its movements, and gives no more chance to the gunner than a rabbit in thick cover.

The rock-wallaby of Flinder's range is *Petrogale xanthopus*, which is the largest animal of the family, being about thirty inches long, exclusive of the tail which is about twenty-five inches. These animals seem to have undergone considerable modification from the ordinary

type of wallaby, which is never found on rocky ground. They differ in several respects from the wallaby of the plains, particularly in the tail, which is thin and cylindrical with a heavy tuft of hair at the tip. In habits they do not differ so much from the ordinary type. They are found in small droves of sixty or seventy; or twenty, or less, where they have been much worried by the gunners. They are shy; but this is probably an acquired trait, as in distant parts of the colony I have watched them basking in the sun, feeding and playing together for an hour at a time. They are very playful animals, the young especially so, and will gambol with and chase each other, the old ones also often playing with the young. I have seen them as far north in this direction as I have been, that is nearly to the extremity of Flinder's range.

Many of the typical Australian birds such as the laughing jackass, cockatoos both black and white, and other parrots, are often found at a considerable elevation in these mountains. The parrots range up to two thousand feet at least, the jackasses even higher. The wedge-tailed eagle, eagle-hawks, and a gregarious kite are frequently seen. The last-named will descend to the carcass of a horse or sheep in flocks of twenty to thirty, and prey on the carrion like vultures. More singular still, they breed in company, and I have seen more than a dozen of their nests placed like a great platform on a low tree some thirty feet above the ground. The nests were so close together that they actually touched; and some of the birds perched on branches and anxiously watched, and others hovered overhead while I climbed up to examine their homes. There were three unfledged birds, or eggs, in each nest, except in one case, where there were four. The eggs were white splashed with light brown. I could find no evidence that the young were fed with living prey; and the nests were in a very filthy condition.

The sea-eagle occasionally sweeps in from the gulf and pays these mountains a visit. I think it breeds in some of the ravines; but I could not find the nest.

In the winter of 1893 I paid Lake Torrens a visit, and

spent a week or two in the desert to the north-east. I was accompanied by one white attendant only, and a couple of blackfellows. This journey, out of the beaten track, was trying enough; but railways will ultimately open up all this country, and what is of interest to-day will become common and unworthy of notice to-morrow, I fear. For I have perceived that one peculiar trait of my advancing countrymen is that they are greatly interested in the hidden portions of their wonderful land only so long as they are unknown. As soon as the country is opened up, and its capabilities for money producing well known, interest in its natural wonders wanes rapidly. I am sorry to see this money grubbing spirit so rife. Strangers come hither with the unconcealed intention of using the land for the sordid purpose of amassing wealth to be spent in their mother countries; and even our home-born sons frequently nurse the desire to forsake the country when their purses are full, and spend their latter days in the land from whence their forefathers came. When the land is thickly peopled and covered with a network of railways, what will be the lot of what I shall here call the Lake Torrens district? Will it be left as a desolate playground for the tired citizen who is willing to face danger and privation as a welcome change from too much prosperity? or will the manufacturer and the miner find huge fortunes here? The latter will probably be the lot of the country, for it is rich in certain classes of mineral productions; and the ground covered by the so-called lakes, if drained, will, I think, be found to be very rich land.

Lake Torrens is a salt marsh of great extent, a large portion of its surface being hidden in reed beds. The salt is as white as snow; but the layer is not very thick, in those parts I visited being generally from half an inch to two inches only. It will not bear the weight of horse or man, breaking under slight pressure like thin ice. Beautifully white as it is it covers a bed of black, stinking mud, so soft that it is impossible to walk over it. It seems to be impossible to devise any means of crossing this

marsh until it is drained. Of its width I have no knowledge—it stretches in many places far beyond the range of human vision. It is not less than a hundred miles long from south to north, and may be much more. I followed its line of reeds for the distance mentioned, and did not then come to the end of it. Heavy rains turn the banks, and probably much of the surface of the lake, into a quagmire which compels the traveller to seek firmer ground. I do not know if much water settles on any portion of the marsh; but I could see the appearance of a large lake about ten miles to the westward. Other large bodies of water were perceived to the northward and on our right. It is certain, therefore, that a few heavy showers result in the country being temporarily inundated, but the water all soaks away in a few days. It can be obtained by digging—in the winter-time at least. Near the marsh it is found at depths of from six to twelve feet, but the water is salt. Five miles from the edge of the salt pan, water is found at ten or twelve feet which, though brackish, is drinkable. It is more or less brackish in all parts of the western side of the Torrens valley, or depression, and, no doubt, on the eastern side also; but as the latter part was not visited by me I cannot say so of my personal knowledge.

Lake Torrens is situated in a valley of at least fifty miles in width, the mountains on the east side approaching much closer than on the west. This range is flat topped with a line of horizontal strata near the top. There are several peaks which look two thousand feet in height; and these mountains are quite distinct from the Flinder's range which trends much more to the eastward. Several lakes lie between the two ranges, some of them of considerable size; but it is doubtful if any of them are permanent. The mountains must drain into Lake Torrens, but there is no permanent stream on the east side; and the quantity of water collected is not sufficient to prevent the formation of the saline crust described above.

Further to the north a great many streams empty themselves into Lake Eyre, but these streams are of the

usual Australian character—a mere series of water-holes in summer, and some of them dry up altogether. I had but a cursory view of this country, the conditions of travelling being such that I had to hasten back with all speed to avoid starvation. Relying on reports of men who professed to have visited this country, I expected to subsist partly on the game which was said to abound there. I saw but little game, and that little was very wild. It comprised a few kangaroo and wallaby, and an odd emu or two, which were so shy that I seldom succeeded in getting within shot of them. All the previous information I collected relating to this district was misleading. Water which it was predicted we should want badly, was always to be found by digging.

A long experience in the bush has led me to place great reliance on digging for water, and I always carried a pick and shovel on my journeys. The time wasted in a fruitless search for surface water would often be more profitably spent in digging for it. In nearly all parts of Australia it is usually found a few feet beneath the surface of the ground. Of course the depth to which a poorly equipped traveller can dig is limited. It is not possible to delve more than twelve or fourteen feet, nor safe to attempt to do so. Rough supports to the soil may be extemporised from trees or large bushes; and the use of side pieces and cross supports should never be neglected, as the earth is very apt to cave in; and in any case the timber is of use to enable the men to climb up and down, which is better and safer than the use of a rope. These precautions are unnecessary if the well does not exceed six feet in depth. Such wells do not take so long to dig as might be imagined. If the water lies near the surface of the ground its presence can soon be detected, and two men used to the work can dig a six-foot well in as many hours; after that depth an hour and a half may be allowed for every foot sunk, that is eighteen hours for a twelve-foot well. Compare this time with the five or six days' feverish search for water which is often the enforced work of the bushman, and it may be seen which is the wisest and

safest course—to dig or search. Very little time need be lost in digging. At least one experienced bushman should accompany every band of explorers, and an experienced man will be able to tell with an hour's digging if water lies near enough to be reached with the spade. If it is argued that digging must be, to some extent, chance work: the reply is, that searching for water in Australia is certainly chance work. Hundreds of dead have been found, empty billy in hand, who evidently spent their last minutes in a wild rush from gully to gully in search of a few drops of the precious fluid which would have meant life to the poor unfortunate; and I have seen it proved that abundance of water was lying three of four feet beneath some of the corpses.

However, I found water everywhere in the Torrens district; often bad, it is true, but always drinkable. In the summer time it is probably more difficult to find. In many places at the foot of the Flinder's range it lies not six feet beneath the surface, and there it is of very good quality. There are also some water-holes in this range which are probably never quite dry.

Some of these mountains are pitted in a very singular manner with a number of small round holes, similar to those which are called by geologists "pot-holes," but they could not here have been formed by the action of running water on rounded boulders. They seem rather to be the result of a peculiar form of weathering or disintegration of the rock. They are so numerous on some of the mountains that the rock might almost be described as being honeycombed with them. The holes are nine or ten feet deep generally, and about the same across, being pretty symmetrical in shape. Some are more than twenty feet deep, and after rain are full of water. Possibly the larger ones have water in them all the year round. In one we found a drowned wallaby, which had been dead some time, having probably accidentally leaped in and been unable to get out again.

The plain country at the foot of the range is a succession of low sand ridges which are thickly covered with a

growth of reeds. We accidentally set fire to some of these reeds when making our camp-fire, and in a few minutes the whole country around us was blazing and roaring fiercely. It was a grand but nerve-trying sight. Never have I seen fire spread with such fearful rapidity as on this night, nor with such a hungry fury. In the morning we could see, from some hills, that several miles of country had been cleared of vegetation.

It is difficult to conceive how these sand ridges were formed. The ground is firm, there being a kind of marl mixed with the sand. There is similar land on the west side of the continent, but there it is not covered with reeds. In some parts of the Flinder's vale there is a sprinkling of trees scattered over the plain, and many of these trees are dead. Where the ground is flat some patches of the grey salt bush were noticed. It was in flower, and this and some other beautiful wild flowers were almost the only objects to relieve the terrible desolation of this district. Mallee-scrub was also seen, and desert-like as the country is, it is everywhere covered with some sort of herbage, including kangaroo grass in places, which is one of the best of the native grasses, and is always a valuable and much appreciated food for a traveller's horses.

Where the reeds ceased to be found the ground was covered with spinifex, a horrible kind of plant, with sharp spines for leaves, which are an intolerable nuisance to both man and beast. Three of the horses were badly lamed by this grass, and a dog we had with us had to be carried a distance of thirty miles. Wallabies and kangaroos avoid spinifex-covered ground, and scarcely a bird was seen during this part of our journey. We would gladly have cleared the ground by fire, but the flames would not spread, and one night we had to cut away the grass before a sufficient space could be had for the horses to lie on.

We had six horses with us, two of them being pack animals, and these we would hobble at night and turn loose to gather their own food. They seldom wandered further than a few yards from the camp—well trained Australian horses never do—and as a rule lay down to rest

almost within reach of our hands. "Camp" is rather a misleading term, but it is in general use, and is well understood in Australia to mean no more than a fire and a "shake-down" on the ground. No bushman seeks for better accommodation in summer-time, but in winter it is occasionally a little trying to lie out in the open. The nights may be very chilly, and during this journey we had several unpleasant drenchings. The rain fell in torrents between midnight and two or three o'clock in the morning, putting out the fire, and benumbing us with a penetrating coldness that deprived us, for a time, of the full use of our limbs.

The rainfall is more or less uncertain in most parts of Australia, and the fall of one or two years is no guide to that of the average of a district; but I feel sure that in the Torrens district there is a greater rainfall than is commonly believed. The water is quickly absorbed, but it does not sink further than a few feet, and there is no good reason for considering this land an irreclaimable desert. On the contrary, I am convinced that it will some day become a highly cultivated and thickly peopled region.

What the mining wealth of the district is I do not feel qualified to state with any degree of assurance. I saw no signs of auriferous reef; but there is copper in the northern part of Flinder's range, and profitable salt works could be established on the Torrens marsh.

As a general result of my rambles in this part of the continent, I have formed the opinion that Torrens and Eyre lakes were anciently a portion of Spencer Gulf, and probably the sea at one time almost cut Australia in two; indeed it would not surprise me if the old theory that Spencer and Carpentaria gulfs were, in former days, in communication with each other, should prove to be a correct hypothesis.

CHAPTER XI

THE HEAD OF THE AUSTRALIAN BIGHT

THERE is one portion of the Australian continent of which I know but very little, though for many years I have been diligently seeking information about it. Perhaps my interest in this portion of the country rests largely on the fact that it is the least known of all the districts of our great land. I mean the central region, which, commencing about the head of the great Australian Bight, stretches in an immense expanse to the heart of the continent. A good deal of this country is still a *terra incognita*. On one occasion, while I was still little more than a youth, I made great, but unsuccessful, efforts to gain permission to join a certain exploring party which traversed a large portion of the west. Afterwards I was a member of several prospecting parties which penetrated far inland, but of that more in future chapters.

As far back as 1888 I wished to spend a month or two in the desert on the Australian Bight. The difficulties in the way of my gratifying this wish were great. The country in question is entirely unsettled: there is not a single port, or even house, for a distance of several hundred miles, one coastguard station and depôt excepted, and the mere proposal that I should attempt to land on this desolate coast was sufficient to induce several persons, including my own father, to question whether I was perfectly sane. But I was not to be turned from my purpose. Finding it impossible to reach the head of the Bight by any ordinary channel, I purchased a small cutter-yacht, the *Swan*, fitted her out at my own expense, and with a

crew of three men and a boy, started on what I consider the most adventurous journey I have ever made.

The *Swan* was purchased at Sydney (where her owner called her the *Esmeralda*), but sent round to Adelaide, as the most convenient port for my purpose, to be fitted out. She was rather old, and her burden was only twenty-four tons, and it was predicted that she would prove to be my coffin, which, I must confess, it is a wonder she was not. I believe my men thought no great things of the proposed voyage, but good wages induced them to take the risk. Fearing that my friends would interfere and stop my preparations, I said nothing of my intentions either at Sydney or Adelaide, and it was supposed that I was only using the little vessel for a pleasure trip from port to port along the coast. Even that was thought a risky proceeding in so small a ship, if ship I may call her, for she was only partly decked, and her small cabin and store-room were scarcely larger than lockers.

At the last moment one of the men repented of his bargain and left me, and I had to replace him with the only man who was immediately available—a Hollander. I have a dislike of foreign seamen, but the sturdy Dutchman proved a good man and true; and as he had been a fisherman, and used to small craft in his own country, he was particularly useful on the present service.

We left Largs Bay on 28th March 1888, but were twice beaten back by strong north-west breezes at the head of Investigator Strait, and were obliged to put into Nepean bay, Kangaroo island, for shelter. It was not until the 5th April that we succeeded in clearing the land and putting the head of the tiny *Swan* towards Fowler's bay, a spot ever memorable as the site of the gallant Eyre's depôt camp. For several days it was calculated that we did not make more than eighty miles in the twenty-four hours. This was as much owing to heavy seas, which prevented headway being made, as to adverse winds, though these last were troublesome. We were swept out of our course, and abandoned the intention of making Fowler's bay. Long rolling seas came in from the south-

ward, and kept the *Swan* rocking in a troublesome and often in a dangerous way; and the advisability of returning to Adelaide was more than once debated.

We were four days out of sight of land, and on the morning of the 12th high cliffs were seen right ahead, apparently about twenty miles distant. In three hours we were near enough to see the surf breaking at the foot of the rocks, and dashing the foam high up the face of the cliffs. There was not even a strip of beach here, and a landing was clearly impossible in the teeth of the half-gale which was blowing from the south-east. We therefore stood along the coast to the westward making a good offing, and running before the wind at six or seven knots, which was all that could be screwed out of the little *Swan*.

Either owing to currents, or from the strength of the insetting sea, the boat showed a tendency to warp inshore, and it was considered necessary to tack and work out to sea. The wind moderated during the night, though the heavy swell continued, and in the morning the land was quite out of sight. We had a trying day, several waves broke over us, and we expected to be swamped. Our escapes were so marvellous that I do not wonder at sailors believing in the "sweet little cherub," or some other form of special Providence.

On the 14th the land again hove in sight, and we determined to attempt to reach it, for the *Swan* seemed strained and was making a good deal of water. At four o'clock in the afternoon we were within a mile of some lofty cliffs that showed clumps of bushes on their faces, and as if in answer to our prayers, thought, if not actually uttered, the weather underwent a sudden change, and the wind dropped to a light breeze. The cliffs here, however, descended sheer to the water, and we could not see a landing place, nor could we find anchorage. We had not line enough to take deep soundings; but the depth exceeded fifty fathoms a mile from the shore.

We thought we might venture to stand along the

shore during the night; but just after midnight the lead suddenly gave eighteen fathoms and we let go the anchor. Worn out with the exertions of the past fortnight we all enjoyed the first undisturbed sleep we had been permitted to have since putting to sea.

At daylight the land was seen to be less than a mile distant, and as it seemed to be accessible, the skiff was put out, and as it would only hold two men, Martin and I entered her and pulled ashore.

There was a strip of beach at the foot of the cliffs about six yards wide; but the rocks rose almost perpendicularly from it; yet I assayed to climb them. After ascending two hundred feet, I found it impossible to go further, and if I had not taken the precaution to carry a coil of rope with me, I do not think I should have succeeded in descending without an accident.

We had no option but to return to the *Swan*, and coasting along the shore we found, about nine miles to the west, a vast ravine-like gap in the wall of cliffs, which was about five hundred feet high at this spot. There was good anchorage in six fathoms half a mile off this opening, and again landing we made another attempt to reach the country above our heads.

The gap had been made by extensive falls of a chalk-like formation, and huge blocks, and small fragments, lay piled together in such wild confusion that it was only with difficulty and much exertion that we climbed over and among the crumbling mass. Tangled scrub and large bushes covered the broken rocks below and the sides of the ravine, and we had to cut a way through it. The stronger branches, however, were of great use in assisting us to climb up, and in a couple of hours we had reached the top. Nothing was visible except a few low sand-hills and a dense mallee-scrub. Not a single tree could be seen; but no very extensive view of the interior of the country was obtained.

We were in want of water, as no great quantity could be carried on board the *Swan*, which was but a boat,

scarcely larger than a man-o'-war's barge, and as it was necessary to obtain it at once, Martin returned to the vessel to fetch tools and another man, while I endeavoured to walk a little way inland. I got about half a mile, and then found my way barred by a dense thicket of thorn bushes intermingled with a shurb of trailing habit, which formed such a labyrinth of roots over the ground that walking was impossible. Here I shot three or four quails, which, with a small snake, were the only things with life I saw. Flowers too, which are rarely altogether absent from the Australian forests and scrub lands, were here scarcely to be seen. The most conspicuous was a small bine which crept over the bushes, covering some of them with a scanty show of bright little white blossoms.

When Martin and Snell came up we commenced digging without loss of time There was plenty of water at a depth of nine feet, but it was brackish, and only urgent need induced us to be at the great trouble of carrying a few gallons of it down to the boat. The amount of labour entailed in this work may be inferred from the fact that it took us more than two hours to get each four-gallon keg down the ravine to the beach, then the kegs had to be taken, two at a time, by one man in the skiff to the cutter.

There was no sign of water-wear anywhere on the cliffs. On first sighting the ravine I had hoped to find it the embouchure of a stream of some sort; but I do not think that water ever found its way down the gully—in any great quantity at any rate. Above there was no sign of a water-course; but a few gutter-like ruts in the soil might have been formed by heavy rains. While we were off this coast no rain fell; and it is probable that a few tempestuous showers annually form the only moisture this desolate land ever enjoys. Judging from my experience in other desert districts of the continent, I think that the rainfall here is probably greater than the appearance of the country would lead a casual observer to think; but as it falls in sudden showers, with long and uncertain intervals between them, and is quickly soaked up by the

soil, the vegetation does not reap the full benefit of it. I have known as much as two or three inches of rain to fall in the central desert of the west in the space of six or seven hours, and evaporate and soak away so speedily that the next morning it could not be discerned that any moisture had blessed the land for months past. Yet these sudden showers have a great effect on the grass and scrub growths of the country. A single shower in the space of a few days can turn a sandy desert into a green and flower besprinkled meadow. But the moisture does not affect the larger growths of scrubs and trees. Yet many of the desert plants are remarkable for the great length of their tap-roots, which descend to the water which collects in most Australian plains at a short depth beneath the surface.

The spot where this first landing on the coast of the Great Bight took place, I suppose to lie about mid-way between the frontier post of Eucla and Dover Point; but as I was not seaman enough to take bearings, points and distances can only be laid down approximately.

The quails referred to above were of the *Synœcus australis* species. There was nothing remarkable noted about them or their habits in this district; and they are only mentioned as showing the distribution of the bird.

We remained at anchor during the night and at day-break continued to coast westward. The cliffs were so high as to appear almost mountainous, but very little verdure showed itself. Here and there were a few trees and bushes; scrub could sometimes be seen on the tops of the cliffs, or descending a little way down their faces. All these plants seemed to be stunted in growth, and occasionally a dead tree stood out, weird-like, against the sky-line. In most places the cliffs rose sheer from the water, and nowhere was there an actual break in the line; but in a few places great falls of the rock had occurred, forming gullies similar to the one at which we had landed, and down these the scrub ran almost to the brink of the sea.

Several points rose boldly from the sea forming bays and open roadsteads; but none of them, I should think, would afford shelter from southerly gales; and nowhere could we find a landing-place where it would be possible to reach the country above without a stiff climb. Along the base of the cliffs there is a narrow strip of beach, often completely covered at high-water; and in some places the action of the waves has eaten out caverns in the face of the rocks at a considerable height above the water; but for long distances there are absolutely no landing places; and a vessel caught in a storm off this coast would have no alternative but to put out to sea or be dashed to pieces. I cannot dwell on the risk of such a craft as the *Swan* remaining on such a coast, lest it should be thought I wish to magnify the importance of what was a mere pleasure trip in a tiny yacht; but I felt a good deal of uneasiness, especially as the weather more than once threatened trouble. The *Swan* had never been a crack sailer, and recent alterations, although they had strengthened her frame, had not improved her sailing qualities. We could not have got off the coast in the face of a stiff gale.

Nearly the whole of the time we were in the Bight, we had plenty of wind, but not a drop of rain, though several times a storm seemed to be imminent. We did not land at all on the 16th. On the morning of the 17th, a ship was seen hull down in the offing, and a large sperm whale (*Physeter macrocephalus*) was lying quietly very near to us. Shortly afterwards a school of twenty of these animals came in sight; and we concluded that the vessel in the offing was a whaler, in pursuit of them. She had probably made a capture as she appeared to be stationary; but she was so far off that we could only see her topmasts through a spying-glass. Several of the largest of the whales were thought to be sixty feet long; and they must be dull of sight and hearing, otherwise it is impossible to believe that they would not have discovered us. Some of them passed very leisurely within three hundred yards of us, going eastward, in which direction the school disappeared. Before the last of them was out of sight an

enormous shark passed so close to us that we had a full view of it. Like the whales, which it appeared to be following, it swam slowly, passing the *Swan* at a distance of eighty yards. I can, therefore, testify that its length was at least forty feet; and in bulk it seemed to be nearly equal to some of the whales. From the circumstance of its great size, there can be no doubt that this was a specimen of *Rhinodon typicus*, or the great Pacific basking-shark. Had we known this at the time we should have been spared a shudder: for the basking-shark, though the largest fish of its genus, and probably the largest of existing fishes, is harmless to man. Indeed, some naturalists declare that it is a vegetable feeder; and the conformation of its jaws show that, at least, its prey is much smaller than that of the "man-eating shark."

Coasting along very leisurely, we reached a spot where the landing looked so comparatively easy that I was tempted to go ashore again. This was behind a great headland six hundred feet high, which was crowned with bushes, but was perfectly bare on its faces, and of a white colour, all the cliffs on this part of the Bight seeming to be of chalk formation. The headland, which we believed to be Point Dover, was ninety miles by dead reckoning (or guesswork, if that term is too nautical) from the last landing-place. We landed here on the 18th, and found no great difficulty in climbing up to the country above. From the top of the cliffs we could trace the coast-line much further to the south-west than was possible from the deck of the *Swan*. The atmosphere was so clear that we were convinced we could trace the cliffs for a hundred miles. The ship seen on the 16th was still in the offing, distant about fifteen miles, and there could now be no doubt that she was a whaler, and probably a German or Hollander. We had a good view of her through a glass, and could see by her movements that she was looking out for whales, probably for the school of which she had already taken toll.

Inland the view was bounded on the north, north-west, and west, by some low hills, covered with scrub and a

few trees and bushes, many of which were plentifully furnished with long, strong thorns that made sorry work with our clothes when we attempted to walk among them, and inflicted severe scratches. There was here also a dreadful plague in the shape of the sand flies, which irritated us greatly. These tormenting pests could not be kept out of our eyes and ears, and small as they were they bit most cruelly, and set up an irritation of the eyelids that lasted many days, causing a running which effectually glued the lids together after sleep, so that they could not be opened till they had been bathed in warm water.

We searched the country east and west for water, but no stream or pool could be discovered; and though we sunk several wells, one of them as much as twenty feet deep, we could find none of the precious element. On the 19th we walked inland to the hills to the northward, hoping to find water there, but were disappointed in this.

The country, as viewed from the top of this ridge, presented no relief to the eye. It was a scrub waste, with here and there a ridge of low sand-hills. To the south-west we could perceive a range of more pretentious elevation. It was situated at a great distance, as much as thirty or forty miles, it was thought, from the spot on which we stood.

The only living things we saw were insects, a few lizards, which were too nimble to be caught, and some birds flying at a distance. The only shot we fired was at a solitary small bird, which fluttered from bush to bush till the cruel gun put an end to its pretty tricks, which much resembled those of a titmouse; such as hanging head downwards, prying and searching under the leaves, etc., and flying restlessly from branch to branch of the bushes. It was, in fact, a shrike-tit (*Falcunculus leucogaster*), a beautiful little bird, several species of which are found in the southern half of the continent. This particular species is, I think, confined to the west. It is distinguished by a white breast and abdomen, while the

same parts in another bird of the same family, common near my home in New South Wales, are of a light yellow colour.

As these birds are eminently woodland haunters, it is singular that this odd specimen should be found here, where there are but few trees, and these not very flourishing. They are not solitary birds in their habits either, but generally associate in small parties, which, though they scatter a little when in search of food, they seldom fly out of sight of each other. Sometimes a dozen may be seen on the trunk of one tree, tearing vigorously at the bark that they may get at the insects which lurk beneath it, and it is surprising what strength so small a bird is capable of exerting. Strips of bark are sometimes torn off which weigh more than the bird that tugged them from the trunk.

The shrike-tits have a noisy and boisterous note, freely uttered when anything annoys or angers them, and they will fiercely attack other birds that intrude on their particular trees. They feed on insects and grubs of all sorts, principally on those which infest trees, but the birds will attack ant-hills, and may often be seen on the ground turning over leaves and rotten sticks with an impatient jerk of their pretty crested heads. They are as familiar in their general habits as English tit-mice, and will permit a near approach of an observer; but, as a rule, they work on the trunks and branches of trees at some distance above the ground, and I have seen them at work on fallen timber which was in a state of decay.

We were now compelled to seek water without delay, the stock on board the *Swan* having sunk very low. We therefore coasted along the cliffs, still to the westward, landing at every likely looking spot, ascending to the plain and digging whenever we thought it likely the necessary element would be found. In this way we succeeded in replenishing our barrels with water which, though neither actually brackish nor saline, was not good and had an unpleasant flavour, something like that which is often found in peat-water.

My crew consisting of so few hands, only two in fact capable of working the boat, we could not keep an efficient watch at night, and always anchored during the hours of darkness. We found good holding ground in from four to twenty fathoms at varying distances from the shore—the greatest being about two miles, and though on a few occasions there was wind enough to cause a long rolling swell, we never dragged our anchor, or seemed to be in any great danger—the occasion already referred to excepted.

At no part of the coast did we find any material change in the characteristics of the back-country. The range of hills which had first been sighted by us from the back of Dover Point (as I suppose) was visited, and found to be a barren terrace of cliffs some two thousand feet high. At the top of them was a stratified line looking like an artificial wall. They were almost bare of herbage, but there was a dense scrub on the plains which surrounded them, and this scrub was full of wallaby, and six emus were seen in the distance. We tried to approach them, but they were wary and moved away long before we could get within gun-range of them.

At this part of the coast the cliffs gradually diminish in height, are easy of access, and broken at frequent intervals. A landing can be effected almost anywhere, but there is no water and but few trees. Parrots and other birds were seen, and there is considerably more animal life here than on any other part of this coast which we visited, yet the land is a desert. The soil is poor, and I am not sure that irrigation would materially improve it. Where there is mallee-scrub good ground may be confidently hoped for. Therefore it is probable that it is only the lack of water that renders the land above the cliffs at the head of the Bight so sterile, but we saw no mallee-scrub westward of Dover Point. The herbage near the cliff-range (which may be that marked Russell range on the maps) consists of low thorny bushes and dwarfed plants of many different kinds, amongst

which we recognised several that are known in South Australia to be indicative of the worst description of land.

On the 23rd we saw four natives on a cliff looking at us. Through a glass we perceived that a white-bearded old man and a boy of about fourteen years were of the party. Two other men had spears and throwing-sticks in their hands—the old man and the boy seemed to be armed with waddys (a kind of club) only. I would have liked to go ashore to them; but neither of the men would accompany me, and I thought it unadvisable to go alone. The blacks remained watching us for about half an hour and then disappeared. Their presence is proof that water must be obtainable in this country though we could not find any; and it may be mentioned that natives have been seen by travellers and seamen at various points all round the Great Bight, even at those places where no water could be found to exist. Where do the blacks obtain this prime element?

My opinion is that ponds, or water-holes, must exist at a short distance in the interior, and one of the chief objects of my journey hither was to make an excursion into that huge blank space, which is still found on all maps of this region. This wish, when it came to the crucial point, I was unable to gratify. Though Martin had promised to accompany me, his courage failed him at the last moment. Suyker, the Hollander, offered to go with me, and we made three several attempts to penetrate the scrub in a northerly direction. We never advanced five miles from the coast. To walk through the scrub was impossible; and to cut a passage we found so difficult, that it is certain we could not have advanced at a greater rate than four or five miles a day. There was no game in the country, and no water. Both would probably have been found if we could have advanced a few miles; but meanwhile we should have been compelled to carry all our necessaries, water included, and have worked our way a yard at a time. The task was manifestly beyond the strength of two men no better provided for such an under-

taking than ourselves, and therefore the attempt was abandoned.

It was our custom to put out fishing-lines at night while the vessel lay at anchor, and we also frequently fished during the day, the food thus obtained being a most valuable addition to our daily fare. The fish bit very freely, and we could always catch many more than we required. The night-lines were invariably drawn in with a fish on each hook.

The most notable fact concerning the fish of this great bay, or gulf, is the large number of bream or perch-shaped species that are found in its waters. Many of these I never saw before this occasion, and most of them were new to my companions also. One of the most remarkable captured was a handsome zebra-fish of the *Chætodon* family. Bream-shaped and weighing four pounds, this fish was striped zebra-fashion with bright bronze, yellow, brown, and blue, with some shades of red about the regions of the fins. The fish most prized by us for food were albicores, barracudas, bonitos, and dories. The three first named were very abundant, and formed the bulk of our captures; but altogether more than fifty species were taken, nearly all of them edible.

At this time I do not think that the waters of the Bight had been much frequented by professional fishermen; consequently the fish swarmed, and were comparatively tame. It may not be generally known that fish, like other classes of animals, learn caution by acquaintance with man's destructive ways. Such is the case, however, and ground that has been much fished over, especially by trawlers, is always noted for the shyness of its fish; and notwithstanding the vast numbers of these animals that swarm in some waters, constant fishing materially diminishes their numbers. The great fishing stations of the world are experiencing this. The fish on the Newfoundland bank are far less numerous now than they were as recently as the years 1861-70, and I have recently learned that boats sometimes labour all day on the Dogger Bank and take not more than forty or fifty

pounds weight of fish. Australia is a young country, and no great destruction of the fish has yet taken place in any of its waters, but more than one well-founded complaint has been made of wanton waste in this respect. Fish are destroyed wholesale, and used for manure, especially by certain classes of agriculturists, with the result that there is a perceptible diminution of their numbers in some of the most frequented fishing districts.

During our little voyage round the Great Australian Bight we saw some immense shoals of fish, but my chief interest lying in another direction, I had not much time to devote to studying their habits. I hope to give more attention to Australian fishes in a subsequent chapter treating of the Great Barrier Reef. I do not know from personal observation, but I have heard that the Bight waters are now much used by fishermen. What particular parts of the Bight they frequent I, also, do not know. It must be a dangerous coast for such craft as the fishermen generally use: probably they do not approach the head of the Bight. The fishing therefore must be a deep-sea fishery, for there is a good depth of water (more than fifty fathoms, the length of our sounding-line) two or three miles off all parts of the coast approached by us.

I can, in concluding this chapter, only add my evidence to that of others who have explored this Bight, by repeating that there does not seem to be a stream of any kind emptying itself into the bay for a distance of several hundred miles, nor a single water-hole, even of the smallest size, on the same extent of coast. Neither did we see any bay or inlet which could be turned into a good harbour, or even into a temporary refuge, for a ship in distress. It seemed to us that a vessel caught by bad weather within the heads of this vast bay would have no chance of living unless she could at once work seawards.

On the morning of the 25th a strong north-west breeze set in and blew us off the coast. The *Swan* could not stand before it, and though the weather would not have been heavy for a large vessel, such a tiny craft as ours was in

some jeopardy, while the wind was at its height. We shipped several seas, and there was some anxiety amongst us. Fortunately my men were good sailors, and no chances of making the best of the little *Swan's* capabilities were lost. But we were driven an alarming distance from the land: it is believed about four hundred miles.

I wished to make for Swan River; but in the face of opposition from the men I had to abandon that intention. They consented, however, to try and beat up to King George's Sound; chiefly, I suspect, because that there we should find the nearest harbour of refuge, but the wind was too strong. In vain we strove to tack: every hour we were driven further and further out to sea; and at length we threw up the boat's head, and shaped the best course we could back to Adelaide.

The last part of the coast of the Bight we saw was a group of small islands, the largest appearing to be less than a mile across, and on an outlying rock of which we nearly came to an end. The wind took us perilously near, and it was only by a nice manœuvring of the sail that we escaped a disaster that could not have been less than fatal to us all.

On the 28th we passed close to a large foreign steamer (believed to be a Russian), the name of which could not be discerned. We were in such straits at the time that I felt justified in ordering signals of distress to be shown, but no notice whatever was taken of them. The same thing happened again on the 29th, and this time, I am sorry to say, with a ship that was undoubtedly English. As she passed under full steam at a distance of four miles it is possible that we were not seen, for merchant ships at sea, I fear, seldom keep an efficient lookout—if, indeed, they keep any at all. I earnestly hope that this was the cause of our being left to our own resources by both the Russian and the Englishman. At anyrate their remissness, or unkindness, saved the *Swan* and the few belongings we had on board of her, for if the opportunity had offered, I should have deemed it my duty to abandon her.

During this day we rigged up outriggers, and they proved to be useful, and helped us to lay what we considered a better course for our "desired haven." Previously to the use of these aids we had to be much more careful to dodge the heavy seas, for often we expected to be swamped.

On the morning of the 29th we had the first rain that fell upon us during our cruise, in the shape of a series of heavy squalls with violent showers. The squalls bothered us greatly: but notwithstanding the great labour of the little vessel (her movement was too jerky to be termed a roll), we saved more than a dozen gallons of the best water we had tasted since the Adelaide supply was exhausted. This was collected in a tarpaulin spread over the waist of the *Swan*. The canvas was first lashed across this dangerous space as a protection; but when the storm beat a hollow in it, and the rain settled therein, we took the hint with the result that a couple of kegs were collected during the day. It is worth noting that if it had not been for this unexpected supply we should not have had sufficient to last us until we sighted land.

On the last day of the month the weather moderated considerably; but for the next four days we had what sailors call dirty weather, that is gusty squalls, with nasty chopping seas that caused the boat to work fearfully and make several inches of water in an hour. The boy, or the cook, was, therefore, nearly constantly working our small hand-pump, and all of us suffered greatly from exhaustion. Not one of us had more than an hour's consecutive sleep during a period of eight days, and that short doze was only taken at long intervals, when extreme exhaustion rendered the frame incapable of further endurance, and the tired man dropped where he stood, and instantly slept, in spite of his sodden clothes. For the water somehow found its way under the oilskins, and when the man was heated with exertion quite a cloud of steam rose from his body.

This was no time for nice behaviour; and when the sudden occasion arose, as it did all too frequently, a heavy

kick, and a rough expletive, admonished the sleeper that he must instantly arouse himself if the ship was to be saved. To me it was an experience of a lifetime, and I have often wondered to myself that I contrived, considering my inexperience, to make myself as useful as I did. I knew, however, the value of a bold front, and was quite aware that however unfit I might be, in a practical way, for a command at sea, that a sign of collapse on my part would certainly unnerve the two men on board on whom the salvation of the boat must depend, for the cook was no sailor, and the boy too young to be of much use.

For several days there were gusts of wind and drizzling showers, which, though no great quantity of rain fell, were very cold and depressing, and occasioned a fog which prevented our seeing more than three or four hundred yards ahead. The wind shifted occasionally, varying between north-by-east to due west, with an occasional squall of exceptional violence from the south-west or nearly due south.

The reckoning we kept was all by guesswork; and though, as I afterwards found, the course was wonderfully correct under the circumstances, I am afraid I must confess that it was a lucky chance that befriended us. Yet I had a system in my dead-reckoning. Calculating, as we did, from the knowledge that the *Swan* could not possibly make more than seven knots on a wind, and that we were probably four hundred miles off the western head of the Great Bight, we thought it would be perfectly safe to edge away to the north as much as the prevailing winds would allow us; our great fear, as I have said, being that we should be carried right out into the southern Pacific. The one or two spells of southerly winds which we experienced probably took us a hundred miles to the north, but on the whole we thought we were gradually drifting to the south.

It was not until the 4th May that we had sufficiently clear weather to enable me to take the sun, a nautical operation that I performed, no doubt, clumsily enough, but which was of great value to us as approximately fixing

our position at L. 129.35 E. by 39.20 S. This agreed so well with our dead-reckoning that we were greatly encouraged, and renewed efforts were made to get further north.

It was certain now that we were quite four hundred miles from the nearest land, and at the rate we were going it would probably be a week before we sighted it. This anticipation gave occasion for anxiety, as the stock of provisions was getting low, and the cook was instructed to economise the expenditure of it to the utmost. Lines were kept towing, in the hope of catching more fish, but in this we were not very successful; and it is singular that few fish are ever taken by a vessel under weigh, though the moment she casts anchor they may be pulled up as fast as the hooks can be baited.

A westerly breeze helped us a good deal on the 5th May, though the weather was again dull and inclined to be hazy. We passed several ships this day, but they were all at a great distance, and probably did not see the signals we made. We were not now in any great danger, but I was anxious to communicate with a passing ship with the object of ascertaining our exact position. More ships were seen on the 6th, and no fewer than seven on the 7th, yet none came very near, and not one answered our signals. Either these were not seen, or were misunderstood, or no lookout was kept on board these vessels.

After this date we had a spell of fine weather, with light westerly and north-west winds, and we knew that we must be approaching land. My observation placed us considerably more to the northward than we really were, and when on the 11th land was sighted, it was supposed to be the coast of Victoria. We reached a beautiful but uninhabited shore at three o'clock in the afternoon, and began to coast southward under the impression that we were nearing Cape Otway. It was soon discovered, however, that we were rounding the southern end of a large island, which we knew could be no other than King's Island in Bass's Strait. Immediately the helm was put to the north, and two days later our adventurous voyage

came to an end in Port Phillip on the forty-sixth day from its commencement at Adelaide, and it was with a deep sigh of relief that I went that night to a comfortable hotel bed in Melbourne.

The *Swan*, I may remark, had received such a shaking that, being old when I purchased her, she was now of little worth, and was sold to be broken up.

CHAPTER XII

A FEW GENERAL REMARKS ON THE SOUTHERN COAST OF AUSTRALIA

I CONSIDER the yacht cruise described in the last chapter to be one of the most important journeys I ever undertook in the interests of natural science. I fear that the results, the new information gleaned, were not in proportion to the risk and expense incurred; but I had the satisfaction of seeing and examining a large extent of the coast of my native land, of which I could never have had an adequate knowledge from books and accounts alone.

My fellow naturalists cannot fail to note that, in my account of the waters of the Great Australian Bight, I have omitted mention of many important genera of animals inhabiting that region. I thought it best to devote a chapter to those genera, the narrative being, as it is, much broken by references to specimens seen under particular circumstances, and consideration of space compels me to skip over a description of many of the less interesting creatures, or those which are fully described in other parts of the book.

All the native mammals, and most of the birds, of Australia are considerably reduced in numbers, as a result of the increase of man on the continent. Not only have I reliable accounts of old settlers and others for my guidance, but I have a distinct recollection that in the days of my youth many animals, and birds especially, were much more numerous than they are at the present day, or have been for many years past. In the older settled parts, and in the vicinity of the great towns especially, whole

families have been driven away, and are seen there no more. It does not follow that they have been exterminated. I cannot say that any particular Australian animal has become extinct within the last twenty or thirty years, except, of course, locally; but many have been driven quite away from districts where twenty years ago they were numerous. The cultivation of the soil has had as much to do with this abandonment of haunts as the more acute persecution of the gunners and bird-netters; but there are some species that will certainly soon be exterminated if active means are not resorted to for their protection. The question is what means can be adopted? Probably an appeal to the common sense of the people would have more effect than drastic laws, for the Australians are a people strongly imbued with republican notions, and they have in several instances defied certain protective laws (notably that for the preservation of the large gum-trees), and they have shown that where the people are determined to oppose an unpopular law, the authorities are powerless to enforce it. This is hard to be believed by law-reverencing Englishmen in the old country; but when and where did it ever happen that the mob in England, impatient at official delay, took it upon themselves to perform important public functions by force, thrusting the "constituted authority" aside in no uncertain way? Such a thing has happened more than once in my native colony. And I do not think the people would tolerate any interference with their shooting and hunting rights. But they might be persuaded, and I hope they will, for that same popular will which is strong enough to defy an unwelcome law is strong enough also to enforce one the wisdom of which is recognised — in fact would enforce it more effectually than an army of police and justices could do.

There are certain birds for the curious or splendid plumage of which there is a never-satisfied demand in the large towns. This is a great inducement to a number of scamps of "larrikin" type to devote their idle energies to the capture of those particular birds, for an idly earned shilling is more thought of by these fellows than a sovereign

gained by the honest sweat of the brow. Among the birds to disappear first will be the lyre-bird, and several of the brilliantly hued lories and cockatoos.

No Australian mammals have suffered more from the continual pursuit of man than the seals, *Otaria lobata* and *Otaria forsteri*, the only two species of this animal, I believe, which inhabit the coasts of our continent. I expected to see something of the first named, commonly called the hair-seal, which used to be very common in King George's Sound and in Bass's Strait; but if it is not entirely exterminated, not more than a few odd ones remain either in King George's Sound or in the Straits. As long ago as the year 1840 the seals were becoming scarce in Bass's Strait. The islands in that channel were occupied by a race of men known as Straitsmen. Each assumed a territory to himself—usually an entire island—where he lorded it as an absolute king. His subjects were a harem of native women from the continent or Tasmania, and a few half-breeds born of these unions. These blacks were employed by their white lords to capture the seals, and as they were expert at the work, the animals rapidly diminished in number. No respite was granted to the unfortunate animals, nor was the breeding season respected, and the result is that a seal in Bass's Strait is now as remarkable a sight as one on the coast of Cornwall. Truly an odd one is occasionally seen, and that is all, I believe.

Fur-seals (*O. forsteri*) were found in the Straits, as well as hair-seals (*O. lobata*), and the former may occasionally be seen on the retired portions of the coast of my native colony; but the seal-rocks near Sydney, and the Port Stephen district, have long been entirely forsaken by these animals.

No fur-seals have ever been reported from the south-west coast of Australia; it is the hair-seal that inhabits that region, and though it is of inferior value commercially to the fur-seal, it has been much sought after. According to the reports of many whalers with whom I have spoken, the hair-seal has been seen, in limited numbers, along the entire coast of the Great Bight. That these reports are

correct I have no doubt, but I am afraid that those whalers saw but to slay. At anyrate, at the time of the *Swan's* cruise, they were so scarce, or shy, that I failed to discover any.

In King George's Sound a few still linger; but if one is seen there by any wild fowler he never fails to discharge his gun at it though it may be only charged with an ounce or two of small shot. So it happens, sometimes, that the poor animal gets away to die a lingering death. If killed it is of small value, as the skin is comparatively worthless.

How far north, on the west coast, this species ranges I do not know. I have not traced it beyond Flinder's bay, where one was killed near Port Augusta in 1889. There appear to never have been any seals on the northern parts of the west coast, nor on the north-western; but it is tolerably certain that both hair- and fur-seals visited nearly all parts of the coast of Victoria and New South Wales, until those colonies became pretty thickly inhabited by white settlers. They, however, always retired to breed to the small islands at a distance from the mainland. Very small islands were generally chosen for this important function—why, is a puzzling problem which I have been unable to solve. If concealment was the intention of the animal, its instinct seems to have misled it—a very unlikely thing. An island of a few square miles of surface is not a spot where an enemy would be likely to look for the young of so large an animal as the seal, especially when the breeding place was situated many hundreds of miles from the mainland; but once found, the smallness of the area greatly facilitated the destruction of the game, and rendered escape impossible.

All the typical Australian gulls and terns were seen in the Great Bight, though some of them appeared to be only casual visitors to that district, and others were more numerous than on any other part of the coast known to me. The commonest was the Australian tern (*Sterna australis*), and almost equally abundant was *Larus pacificus*, the only true gull known to me as an inhabitant of our coasts. The tern is found all round Australia, but

the gull is confined to the south coasts. I have not seen it on the east side so far north as Sydney; and only odd individuals, or small roaming flocks, come eastward of Wilson's promontory, Victoria. From that point, it is more or less abundant as far as Cape Leeuwin, and seemingly as occasional visitant, I have met with it as far north as the North-West Cape, Exmouth Gulf—that is a hundred miles within the tropics. Probably, however, these northern flocks are only wanderers; many of the gulls are great rovers, and if what whalers have told me is correct, this bird, generally called the great black-backed gull, is found as far south as their ships ever venture, and that is almost, or quite, to the antarctic circle. In Australia it is nowhere so abundant as on the coast of the Great Bight. It cannot be questioned that it breeds in the desolate lofty cliffs of that vast bay. Without actually seeing the young (we were probably there at the wrong time of the year to find them breeding) we saw the nesting places of these and many other species high up the face of the cliffs. The number of birds that assemble there on occasions, and the extent to which the rocks were discoloured with their droppings, placed it beyond doubt that millions of those birds annually breed there. In fact the east of the Bight is as remarkable for the multitude of its sea-birds, as the country inland is for the scarcity of land-birds. Every morning immense numbers of them go seaward, no doubt to their feeding places, but many hover about the waters inshore all day long; the noise of their cries when they are assembled at their roosting places on the cliffs, can be heard at a very great distance, and is much accentuated to the listening ear of the wanderer by the awful solitude of that district.

The storm-petrel is also a plentiful bird in the Bight. *Oceanites oceanicus*, Wilson's petrel, is the specific name of this bird; but the whalers still call all species of this bird that are recognised by them to be petrels "Mother Carey's chicken," and their lives are as sacred in the eyes of the rough sailors as are those of certain land birds to shore people. During our trying voyage, this little petrel

was always in close attendance on us, flying close to the tiny vessel, and often over it at a height of a few feet only, and without indulging in any foolish superstition, I certainly shared the satisfaction of the men in having this friendly little stranger so constantly with us. It seems that the popular opinion among landsmen is that sailors hold the petrel in awe, and look on its approach to a ship as an ill omen. This is a mistake, or else sailors have greatly changed their opinion. It is the desertion of the neighbourhood of a ship by these birds that is considered a forewarning of doom.

Among the rarer birds of the Bight the wandering albatross may be numbered, but it is seen occasionally off all parts of the coast, especially in remote places, for this is a bird that avoids the haunts of man. It will follow ships and hover about them; but I have never seen it near a big coast city. In Australia I have seen it only as a solitary bird. There a pair, or a greater number, are never seen together, but as I have seen an albatross near the same spot for several consecutive days, I have been in doubt whether I was viewing the reappearance of one bird, or of two, or more of them.

In the Bight I witnessed the very unusual sight of an albatross swimming—I suppose for the purpose of resting its wings, for it feeds on the wing. Old navigators and naturalists were much puzzled at finding the albatross at vast distances from land, and put forward all sorts of theories to account for its apparent ability to do without rest for days, if not weeks, together. It was described as flying thousands of miles without alighting, as never resting except occasionally on the mast of a passing vessel, and as sleeping on the wing. All this guesswork was wrong, the fact being that the albatross sleeps, like many other species of the gull tribe, while floating on the water. Probably all gulls occasionally sleep in this situation, certainly most do. They also rest and sleep on any floating object they find at sea, as on a castaway barrel or plank; and off the coasts of North Australia and Queensland, I have often seen terns sleeping while perched

on the backs of floating turtles, which also seemed to be asleep. Yet these birds (and no doubt albatrosses) roost on rocks when at home. As I have said above gulls are great wanderers, and I am convinced that the albatross is not the only species that spends many days at a time on the open sea without a visit to the land.

I have not collected as much information as I should like to possess concerning the food of the albatross, but I am convinced that it is a sea-scavanger, a marine vulture, preying on any garbage it can find, or that is thrown to it from a ship. It will pounce eagerly on the entrails of a fowl thrown overboard to it, or on a dead fish or piece of salt-junk, or bit of biscuit—in a word, on anything eatable; but no sailor that I have conversed with has ever seen an albatross catch a fish for itself, and as I have watched them for hours at a time wheeling and sailing, rather than flying, over the surface of waters that I knew were swarming with fish, I am convinced that they do not catch living prey. I once amused myself by throwing dead rats to some ravenous albicores which were following the ship, when an albatross, which was also attendant on us, made several attempts to obtain a rat, but displayed an amusing caution in avoiding contact with the albicores. Whether these ravenous fishes would, or could, seize a bird of the size of the albatross I do not know; but the albatross was evidently disinclined to run the risk of such a fate.

The albicore, like the shark, is one of the few fishes which can be caught by hook and line trailed behind a rapidly sailing ship; and on the occasion referred to, no fewer than fourteen of them, most of them weighing over thirty pounds each, were hauled aboard, and the garbage from all these found its way into the hungry maw of the bird. The actual weight of the food consumed by the bird, in the course of a couple of hours, I cannot state, but it could not be less than six or seven pounds—that is about half its own weight. For these birds, notwithstanding their great expanse of wing (often ten or eleven feet) and great apparent size, seldom weigh more than fourteen or fifteen pounds. Digestion is performed very quickly by

gulls, and I daresay a portion of the food passed through the body of the bird before its meal was finished; but that it gorged itself so excessively fully justifies the title I have applied to its kind. They are sea vultures.

After its gorge this albatross disappeared, to seek, I presume, a much needed rest.

CHAPTER XIII

KING GEORGE'S SOUND

THE year (1889) following my voyage in the *Swan*, I paid a visit to King George's Sound, and subsequently to other West Australian ports, my business being to prospect the country with a view to starting a cattle farm in the colony, for even at this date most of the best land in all the eastern colonies was occupied. What the future of the country will be I have sometimes thought over with anxiety. Unless the land is to enrich a favoured few, and a favoured few only, the land-grabbing mania will have to be counteracted, or peremptorily stopped.

I was surprised, on my first arrival in England, to find many persons, whose education and intelligence I should have thought would be a guarantee of better information, believing that there were few, or no, abjectly poor persons in "prosperous Australia." This is a common and serious mistake in England. There is, proportionally, as much sordid misery and vice in our big cities as there is in Liverpool and London, and those who expect to land penniless in any one of our colonies, and yet pick up a fortune in a few years, are as simple as the old-fashioned bumpkins one reads about in old books who were persuaded that the "streets of Lunnon be paved with gold."

Capital is wanted in Australia to ensure the prosperity of the individual as surely as it is wanted in the mother-land, and the big capitalist has the best of it in the new land as in the old—far too much the best of it; and men with sixty or a hundred thousand acres, without reckoning a back-run of perhaps three or four times that extent, are

inconsistent with the existence of a yeoman population. The two classes, the large gentleman farmer and the small yeoman, cannot exist side by side in a country like Australia. What they do elsewhere I do not know, and therefore will not presume to judge how they work together; but in Australia it is the men with excessively large estates who are causing rises in the price of land in the old colonies; and rises in the price of land beyond a certain sum are fatal to the prosperity of small farmers. But this is not King George's Sound, and "the rambles of a naturalist."

King George's Sound is an important region both in a historical sense, and as a sub-district in Australian fauna. With the first I have here nothing to do, but I may pause to remark that it was the spot selected by the French Government, in 1825, for the settlement of a colony, which, had it been established, would have robbed us of half our goodly continent. Fortunately the French were anticipated by Major Lockyer and some companies of the 39th Foot (the gallant *primus in Indus*) who guarded a working party of those bugbears of the land—convicts sent from New South Wales—and for a time the settlement was an outpost of my native colony. With the establishment of another settlement at Swan River the colony of Western Australia entered into life. Its actual birthday, as registered in the official records, is the 1st of June 1829; but the convict labourers were at work there some considerable time before that date. These men worked in fear of the lash and the loaded musket, and though their compulsory labour was not without beneficial results to the general community, it is surprising that any settlement survived this introduction. The early history of nearly every settlement on the continent is a revolting story of flogging, hanging, and the crimes which led to those drastic punishments. As, in time, the convicts were granted tickets-of-leave, they became practically free men, and permeated nearly every class of colonial life with disastrous results, which, by mere good luck, I think, stopped short only of being fatal to our great and progressive country.

The scenery about King George's Sound is not in any way so striking as that of most parts of Victoria and South Australia; yet there is far more vegetation on the land than on some spots further north and west that we shall have to glance at presently. There are hills also about the shores of the Sound, and some forty miles inland can be discerned the Stirling range, the most imposing rocks in this part of the country. The natural features of the land have undergone great changes owing to the works of man, and the improvements of tillage and cultivation, and it is not until the naturalist has penetrated well into the interior that he is in a position to appreciate fully what a decided change there is in the fauna and flora of the country when compared with the eastern side of the continent. Precisely where the change begins I cannot say, since I was unable to penetrate the country from the head of the Great Bight. I believe the line is, with regard to many species at least, very sharply drawn; which is the more remarkable, as no great barriers exist which would be likely to interrupt the spread of species. The Blue Mountains of New South Wales, the Alps of Victoria, etc., confine a few species to the eastern coasts; but there is absolutely nothing to prevent the spread of animal forms from the westward of the ranges mentioned above to the coasts of the opposite side of the country. Some species are so spread—are universally distributed over the continent; but they are few in number, and mostly of the larger forms of birds. The great grey kangaroo is not found on any of the great grassy plains of the west, although the country seems admirably suited for its subsistence; and most of the small birds are of quite different species on the two sides of the continent, though on both sides those of the north, where, on account of difference of climate, one might expect to find a difference, do not vary so markedly from those of the south.

That the vegetation should differ is not so remarkable. That is probably due in great measure to the aridity of the soil on the desert portions of the continent. This is a

circumstance that I do not feel so well qualified to discuss as I do the fauna of the two great divisions—for naturally the divisions are two—east and west. North and south the species do not vary sufficiently to make a very marked division; at most they are sub-divisions, and the variation of species on the central plains, so far as I have seen, is utterly unimportant.

Perhaps the most widely distributed of Australian birds is the emu. It is found all over the continent, certain restricted areas excepted; but the birds of the two sides certainly differ. On the east the *Dromæus novæ hollandiæ* is a larger bird, and less mottled in plumage than *Dromæus irroratus* of the western plains. The latter is also a lighter coloured bird, but advancing inland, toward the centre of the continent, I have found an intermediate variety, and I am not sure that it is correct to speak of two species. At any rate, as the two varieties approach each other on the northern central plains, the difference between them becomes very much less discernible, and I am sure that the two species, if species they are, interbreed. I have seen the two birds paired, but I have not observed any difference in the young. The eggs of both species are green in colour, but there is great difference in the shade of the hue. Some clutches, those, I think, of very young birds, are quite a light green, while those of old birds are a dark rifle-green. This opinion, which is the result of careful observation, seems to be confirmed by the number of eggs in a clutch. If they are light in colour, there are usually no more than seven or eight in a clutch; if intermediate in hue, nine or eleven; if very dark the full number of thirteen. I have never seen more than thirteen in a clutch, nor fewer than seven, and I think that the number in a complete clutch is always an odd one. But rarely have I seen even numbers in either clutch or brood of young birds, and I think that the incubating cock (it is always the male bird which performs this duty) has some reason for prefering an odd number to sit upon: for I have often found a single egg lying on the ground a few yards from the nest as if it had been ejected

for some purpose. In such cases there was generally evidence that an egg had been broken in the nest. Was the ejected egg pushed out to maintain an odd number?

The emu is generally described as a gregarious bird, but it is only partially so. I believe that it sometimes goes in family parties; but odd birds scouring the plains are an everyday sight in the interior where emus are abundant. And birds may be seen feeding alone in districts where the traveller may ride for days without seeing another. The hen and her young, also, are often found solitary; for though the cock incubates, the hen seems to take charge of the hatched young. This is contrary to the experience of a keeper at one of our public gardens, who told me that the cock of a pair of emus which bred in the grounds, showed great solicitude in caring for the five chicks which were hatched from a clutch of thirteen eggs. But perhaps the habits of birds and animals in captivity undergo much change. The fact that only five eggs out of thirteen were hatched showed that the birds, although in their native country, were not living under natural conditions.

The emu has been driven from all the thickly settled districts, and is now seldom seen near the dwellings of men, even on the most remote of back-runs. In 1889, and on the occasions of a few other visits within a couple of years of that date, emus might be found at the back of the Stirling range in scanty numbers, and generally under circumstances which pointed to their being chance visitors in the neighbourhood, though I found one nest at a spot some fifty miles north of Albany. Still further north, as nearly as I can guess another fifty miles beyond Stirling range, small flocks of emus, four or five to a dozen in number, were to be found on all the occasions I rode so far afield.

I shall have occasion to mention this incidentally in subsequent chapters; but I think it will be well to finish my remarks on its habits in this place

When emus are sighted on the open plains of the interior they are often travelling in an apparently straight line at a very fast pace. I have chased them, and found

that it takes a very good horse to keep them in sight. I do not think that a single horseman could ride an emu down without the assistance of dogs. Emu hunting is quite as good sport as kangaroo chasing, and is not without that spice of excitement which comes of risking an ugly attack from the pursued game. A kick from an emu is nearly as dangerous as one from a kangaroo. It will break the leg of a man, or send a too venturesome dog spinning through the air with a broken back: and the dogs, unless numerous in number, seldom succeed in pulling the bird down without assistance from the hunter. In helping the dogs the latter should always approach the bird from the front, otherwise he may be badly crippled.

Solitary emus are nearly always travelling across country when sighted, which circumstance leads me to think that they may be only temporarily separated from their flock. When the flock is resting, some members of it will be squatting on their bent legs in a particular manner, quite unlike that of other birds in the same circumstances. The position is a kneeling on the true ankles of the bird, with the legs bent forward, only the tail-end touching the ground. From this position the emu can instantly rise without exerting much muscular power, and thus kneeling they slumber with their heads buried amidst the feathers of the shoulder. They are very light sleepers, and cannot be surprised asleep.

While the kneeling position is the one usually chosen by the emu for resting and sleeping purposes, it also often lies on its side, wallowing like a hen in the dust and sand, and kicking the gravel in clouds about it. It also shakes its feathers in a dog-like manner, and with a noise which can be heard a considerable distance. The sound of this feather-shaking has often apprised me at night-time, when lying out in the desert, of the presence in the neighbourhood of emus when none had been previously seen; and has proved that they are not afraid to approach within one or two hundred yards of a watch-fire, though in daylight the traveller has difficulty in getting nearer to these cautious birds than half a mile. In all the postures of

rest the emus are constantly preening and arranging their feathers, and perhaps destroying the vermin which are apt to invest them. In the act of feeding they are much given to standing on one leg, with the other held loosely, the toes bent backward, ready to take the next step forward.

The calls and cries of the emu are not numerous, or often used. Generally it is a silent bird. When irritated or alarmed it utters a shrill sound—a kind of hiss or low-pitched scream. It has also a sharp, single-note cry of surprise or warning, at sound of which, uttered by the cock-bird, the flock takes to instant flight. The usual note of the bird, used on occasions of which I can only specify a few with certainty, is termed a "booming" by the colonists. It is a deep hollow sound which nearly all hearers describe in different terms, but which seems to me to be well imitated by drumming on an empty cask with muffled sticks. This peculiar sound is uttered when the cock is coaxing the hen, when the latter is teaching her chicks to feed, and by both birds on most ordinary occasions, and especially when there is going to be a change of weather. Incessant booming of the emus is a sure sign of impending rain, and generally of a storm-burst. The loud hoarse cries—almost a bellowing—uttered by the hen emu during the pairing season is a distinct sound from the usual boom, and seems to be produced by her by means of a peculiar purse-like enlargement of the wind-pipe—an apparatus with which the male bird is not furnished. The hen emu is much larger than the cock—a peculiarity common enough among the Falconidæ, but unique, I think, in the Struthionidæ.

Down to the middle of last century the emu was found from shore to shore of the Australian continent. Very few are now left in the old colonies. Though so much scattered in distribution, the bird was not as numerous in individual numbers as many naturalists seem to think it was. They never assembled in large flocks, three or four family parties might be seen in a day's ride, the total of birds not amounting to sixty. I feel sure that the

brood of young birds remain an entire year with their parents, and pair off at the breeding season. Many small flocks, much scattered, give an observer who does not habitually make careful notes, a sense of great numbers, which is very misleading. While the emu was formerly met with in all parts of Australia, and therefore could not be said to be *scarce*, it certainly was never an abundant bird, in the sense in which we should call the kangaroo, wallaby, and exotic rabbit abundant.

Its destruction by the colonists is often very wanton. The blackfellow likes emu, but no white who has tasted emu flesh cares to be at the trouble of cooking a bird for himself. They are shot, therefore, because they are big, or because the gunner wishes to secure a curiosity for himself or his friends, or for any other reason, the food reason being always excepted. The bird is generally very fat, but the flesh is coarse, tough, and tasteless—in a word, not worth the trouble of eating unless a man is starving.

The food of the emu is largely frugiverous, and like all struthious birds it swallows large quantities of sand and pebbles. In some districts of Australia where smooth pebbles are scarce, I have found the stomachs of emus crammed with sand and coarse grit mingled with vegetable matter. In the desert there are a number of shrubs, brambles, and creeping plants, which bear small fruits: these furnish the bulk of the emu's food. The largest of these fruits is a plum-like blue berry, and of this emus are very fond. In districts where this berry is abundant there are sure to be emus, unless the presence of the settler keeps them away. Probably any sort of vegetation is eaten by them when their favourite food becomes scarce. I have found leaves and stalks in the mass of undigested matter taken from the stomach of a recently killed bird, and I have seen them swallow large snails with the shells, and beetles, and other insects; for though the general opinion is that the diet of the Struthionidæ is entirely of a vegetable nature, this is an error, so far as the two great Australian representatives of the genus are concerned. The Australian cassowary in particular is an almost

omnivorous bird, and will devour rats, lizards, and any small creatures generally that come in its way.

Taking King George's Sound as a typical district of the south-west part of Australia, we notice that the change of flora and fauna which takes place there forms the first decided demarcation between the two sides of the continent. I exclude the central desert, which may be a sub-district, but is intruded on, to a great extent, by types from both sides which gradually die out, rather than meet, as they approach the centre of the continent. There is some co-mingling and overlapping of typical families, and some universally distributed species as I have already said, but taking into consideration certain features, as the great compactness of the country, and the absence of many of the usual barriers to the migrations of plants and animals, Australia maintains its reputation for eccentricity in its many sharply drawn limits of species.

So far as I know, the country lying between Spencer's Gulf (South Australia) and King George's Sound is a desert without a single typical tree or animal, and probably without many plants or animals of any kind. There are certainly no great forests, or other prominent and life-influencing features in that vast region, which is at least seven hundred miles wide, and of unknown depth inland. It is probably the most desert part of Australia, the fact that there is no stream, not even a brook of the smallest size, in such a great length of coast as that surrounding the Great Bight, is sufficiently indicative of the aridity of the back country.

But when we reach King George's Sound we light, at once, on a flora that differs markedly from that of Victoria, and the known country to the west of it—that is the colony of South Australia. And the fauna, also, greatly differs, but not quite in so marked a degree as the flora. We must get away from the settlements to note this fully.

Albany, one of the most beautiful and important towns of Western Australia, and destined to be, if it is not already, one of the most frequented ports of call on the continent, is decidedly English in appearance. Here are

English houses, English gardens with apples and pears, and other eminently British fruits, and brave old British oaks abounding and prospering all over the district as they abound and prosper in South Australia and Victoria. Nor are these the only English trees, by very many species, which abound in and about all the townships on the Sound, quite altering the natural features of the land.

But when we get out into the wilds, beyond the settlements, we are better able to note the native species of trees and plants, and compare them with those of the other side of the country. Perhaps the hills, and broken character of the country, afford some shelter to the vegetation of this district. Certain it is that the country for many miles inland on all sides of the Sound, though rather barren in general appearance, has a variety and beauty of scenery which is not found further north on this part of the coast. The hills are typical Australian hills; they are remarkable for strangeness of form, or peculiarity of stratification, and the two elevations between which Albany lies, Mounts Clarence and Melville, are the most Australian-like features of the place.

Another important influence on the vegetation of the Sound must be exercised by the climate of the district, which is cool and moist. Rains are frequent, and often heavy; and fogs from the sea sometimes drift inland, enveloping vegetation and everything else in a thick, clammy deposit of moisture, which is trying to animal life, but seems to be peculiarly beneficial to vegetation of most kinds.

On the plains there is a thick growth of rank herbage, with several species of plants which are common in Europe, yet, strange to say, seem to be indigenous to the country. This is the case if the accounts of the first settlers are to be relied upon, and I see no reason for rejecting them. Among these plants are the common dandelion, and a species of orach (*Atriplex halimus*). The latter I have found in situations to which it could scarcely have travelled, if introduced, in the few years since the establishment of the colony. The "native parsley" (*Apium pro-*

stratum), found mostly in damp gullies, but cultivated for household use by the colonists, is an undoubted native plant, the range of which I do not know ; but I have found it as far north as Shark Bay, where it grows on some parts of the Gascoyne River.

Among the larger members of the vegetable kingdom "swamp-oaks" (Casuarinas) and eucalypti (here, as elsewhere, called "gum-trees"), hold the most prominent place, and at the time of my visit formed, in places, woods of sufficient size to be denominated "forests" by the colonists; but a very careless and wasteful destruction of the trees was taking place, which threatened a sad thinning of their numbers before many years had elapsed. The "wild honeysuckle" (a *Banksia*) is a universal favourite with the colonists, and is spread all over the country in suitable places for its growth. This plant is certainly not found many miles to the eastward of the Sound. It appears about here for the first time, and is found in much greater perfection further north. In this district also the grass-tree (*Ringia australis*) first appears; but it is not found in the immediate neighbourhood of the Sound, except as a cultivated shrub in gardens, nor does it attain to perfection. Other trees which form important objects in the landscapes further north on the west coast, appear here of the size of shrubs. In fact King George's Sound is a starting-point for a large portion of the western flora.

Among plants, well known on the eastern side of the continent which reappear here, I may notice the valuable kangaroo grass (*Anthistiria australis*). This grass appears to be the prevailing herbage of those areas in the interior of the west side which are so frequently marked on the maps as "rich grassy country." It is confined to limited tracts near King George's Sound, but higher up the country, and especially in the neighbourhood of Swan River, it is one of the prevailing grasses.

Near the Sound a variation of species in animal life is also noticeable. The district is the extreme southward and eastward limit of a very typical wallaby, which is so distinct from other members of the family that it is placed,

I understand, in a genus by itself, of which it is the solitary representative. This is the banded wallaby (*Lagostrophus fasciatus*) which is so small that medium sized individuals only weigh seven or eight pounds. The habits of this animal differ in some degree from those of other wallabies. It creeps under the dense herbage, forming tunnels which completely conceal it, and enable it to travel across the country without exposing any part of its body to view. It is consequently very difficult to get shots at it. But it sometimes ventures into the sandy desert tracts, and then, if disturbed, it squats in the nearest patch of scrub, where it will lie quietly until it is nearly trodden upon. It does not seem to be numerous near King George's Sound, but on account of its peculiar habit, it is difficult to ascertain much about its numbers or mode of life. It prefers moist gullies for its haunt, and often inhabits ground which is very wet and swampy—and such as is avoided by other members of the family.

There are several species of rat-kangaroo in this district of which I have identified two only. The first is the common brush-tailed rat-kangaroo (*Bettongia penicillata*), which is found everywhere round the eastern and southern coasts, and is not, therefore, of special interest here. The second species is a very similar animal, but has the tail tipped with white; it must therefore be, I think, Lesueur's rat-kangaroo (*Bettongia lesueuri*).

These small animals, which have the appearance of large rats, are not numerous, and are not often seen unless watched for. They do not come forth from their lurking-places till the dusk of evening, and retire on the slightest sign of approaching danger. They are gregarious to about the same extent as the kangaroos and wallabies; that is, there may be from twenty to sixty or seventy in a colony, but they scatter much when seeking food; and though many may be near, the observer seldom sees more than three or four at a time. Though they resemble rats in outward appearance, there is nothing of the rodent in their general habits, or, indeed, in their internal structure. They bear a single young one (occasionally two) at a birth, and

breed but once a year. This slow increase of the rat-kangaroos, and, indeed, of the whole family of kangaroos, is in strange contrast to the immense numbers of many of the species.

The rat-kangaroos do not progress like the wallabies and true kangaroos by a series of leaps on the hind legs, but run or canter in a peculiar way, using all four feet. They can move very quickly, but if found at a distance from shelter, they can be run down and captured, a thing that can never happen to the leap-progressing wallabies and kangaroos.

At King George's Sound the echidnas, the koala, and the wombat, have entirely disappeared. I thought and hoped that the latter animal might be found there; but I could find no trace of it, nor hear that it has ever been seen in the district. This is another circumstance that marks the change of fauna hereabout.

The birds, too, differ much from those of the other side, though these are overlapping and universally distributed species. All these I cannot find space to enumerate, and many of the small birds are described in the next chapter.

In the course of my long rides in this district, which sometimes extended to a distance of sixty or seventy miles from Albany, I saw several birds which are not known to the colonists to be inhabitants of the country, amongst them a native companion heron, and a stork which I think was *Ardea flavirostris*. These birds were probably stragglers in the neighbourhood, for I could not find others of their kind.

Neither could I learn anything, locally, of a cuckoo which interested me much. I heard this bird on several occasions during my rides, but could never see it, yet the country was poorly wooded with scattered trees only. I think the bird, like others of its family, must be a ventriloquist, and have moved from spot to spot while I was looking for it in a wrong direction. Sometimes I heard it on the right hand and sometimes on the left, and then behind me; but as soon as I approached the spot from whence the sound issued, I would hear the calls in quite another

direction. The bird must have skulked from place to place while completely screened by the scrub, otherwise I could not have failed to see it. This cuckoo does not seem to be known in the immediate neighbourhood of Albany, but is probably identical with a species found on the Swan River. There, however, it does not seem to be of particularly shy or skulking habits.

Birds of the duck family are rather numerous in species, and were formerly so in individuals; but they have been much thinned by sportsmen and professional wildfowlers from the townships. I met several men who obtained a living by shooting the ducks from punts with swivel guns —weapons which carried heavy charges, and cut the flocks of birds up in a wholesale way. These men told me that a few years ago the shores of the Sound and Albany bay swarmed with ducks, but that these had become so scarce that they (the men) contemplated abandoning the shooting as no longer profitable. All the ducks of this part of the country are found also in the Swan River district, in my account of which they are described.

Swans are found on the swamps and rivers of the district, but not in great numbers. They migrate seasonally, and sometimes seem to reappear only as stragglers. One old fowler told me that in some years he had seen no swans at all, though they could scarcely have escaped his notice if they had been in any of their usual haunts, as he was in the habit of shooting ducks in the inland swamps. The black swan is only seen in this district as an occasional straggler, but it is certain it was once abundant here.

The parrots and cockatoos do not materially differ in species from those of the Swan River district, but they are not nearly so numerous, a circumstance that is probably accounted for by the dampness of the climate; for nearly all these birds are extremely impatient of rain, though they do not seem to be so much affected by a considerable degree of cold.

The only other remark on the fauna of King George's Sound that I intend to make in this chapter, is to record

that the fish found there seem to agree in species very closely with those found in the Great Bight, a circumstance which rather surprised me, considering the marked difference in the characters of the two coast lines, and the fact that the water of the Sound is much shallower than that of the Bight.

I spent several days fishing in the Sound, going out with the fishermen in their boats, and on one or two occasions proceeding to sea with them. At this time (1889) whales were sometimes captured by the fishermen quite close to the coast, and a few years further back it was not an uncommon occurrence for a whale to enter the Sound, just as they used to enter Port Jackson and other great harbours. As the capture of a whale is a valuable windfall to the fishermen, the larger boats always had a line, harpoon, and spears aboard, and on the 15th of October the boat in which I was harpooned a large dolphin. It was about eleven feet long, and although I had previously only seen a picture of the species, I at once recognised it as a Risso's dolphin (*Grampus gris*). There could be no mistaking the species, and the peculiarly long, narrow flukes and toothless upper jaw were quite sufficient to establish its identity. It was of a dark grey colour on the back and tail-end of the body, and yellowish grey on the front, and the sides were covered with irregularly shaped markings of light colour, causing the animal to appear as if it had been scrabbled over. It weighed more than five hundredweight, but was easily killed and got on board without difficulty, at a spot about nine miles west of Harding Point.

Dolphins are often captured in this neighbourhood, but the fishermen had never seen one of this species before. The kind that is usually seen about here does not perceptibly differ from *Delphinus delphis*, varying in length, for apparently adult animals, from six to eight feet, and seldom weighing much more than a couple of hundredweight, though I heard of a dolphin, sometimes seen here, which exceeded twelve feet in length. According to the whalers, the "small dolphin," as they call it,

that is the common species, is seen in the Bight in schools of two or three hundred.

Fish that were most common in the Sound and the surrounding waters, consisted of species of rock-cod, ling, barracudas, dories, suckers, conyrodus, albicores, bonitos, and conger-eels. Some of these fish grow to a great size, and some are but little esteemed for food, though all find a market in the townships on the Sound. There is a remarkable absence of flat-fish here, as in most Australian waters, though a fish which I recognised as *Psettodes erumei* is found in scanty numbers in the months of October, November, and December.

All the fish enumerated above were found by me in the Bight, except the congers and Psettodes.

Other fish of the Sound which were not seen in the Bight are dog-fish, which are very numerous and voracious, and the common meagre (*Sciæna aquila*), which is scarce, but grows to a large size, some taken just outside Albany bay having weighed more than one hundred pounds. Sun-fish, too, have been taken which weighed four hundred pounds, and there are a vast number of the lower types of marine organisms, many of which are exceedingly beautiful and curious in colour and form.

Altogether I collected about eighty species of fishes in King George's Sound, some of which are common to all Australian marine-waters. I had nearly forgotten to add that sharks are numerous in and about the Sound, and exceedingly dangerous to careless bathers. Strangers should not enter these waters except at the duly appointed and protected bathing-places.

CHAPTER XIV

THE SWAN RIVER DISTRICT

A SERIES of flat, open, arid plains, with no mountains and but few hills of noticeable elevation, one would expect to find the western side of Australia much warmer than similar latitudes of the eastern division. The reverse of this is, however, the case, but there are great variations of temperature.

I reached Swan River by packet-boat in December 1889. This period of the year is almost midsummer there and the heat is considerable, but certainly not as hot as the average at Sydney, though the latitude of the two places is nearly the same.

I found that during the summer the prevailing winds at Swan River (the district round Perth) were southerly and mostly south-easterly. When the wind shifted to south-west, there was apt to be a spell of chilly weather, the breeze suddenly chopping round to all points of the compass within a period of twenty-four hours. Sometimes there would be showers of rain accompanying this change, and as the winter drew on these showers became frequent and often heavy, especially near the coast, with exceedingly boisterous winds which chilled one to the bones, owing probably to the suddenness with which they came on.

Acting on the advice of old settlers, I waited until the so-called winter season before making an intended journey into the interior of the country, for the western side stands next to the head of the Great Bight for deficiency of water. And ultimately I found that the

coast rains and storms do not travel very far inland, and have practically no influence on the climate of the interior. I never had an opportunity of measuring the rainfall of the interior, but in the years of my journeys on this side of the continent it was very small, yet I think, from what the colonists said, not below the average. It is not surprising, therefore, that there are no forests here, and that the face of the country is but very scantily covered with verdure.

Swan River, considered as a district, has the appearance of a long settled country, yet it is not at all like any of the eastern colonies. The country round the townships is fenced off into meadows, which are mostly of moderate size, and the gardens are full of exotic trees, plants, and flowers, and therefore give the traveller no correct notion of the natural characteristics of the land. But though, as in the eastern settlements, English trees and English animals have been brought hither in immense numbers, one never sees such English-like scenery as is quite common on "the other side," as it is colloquially called throughout Western Australia, or in Tasmania and New Zealand. In both the latter countries I have seen spots which, I am sure, would have deceived any suddenly transported Englishman into belief that he was still in his native country. He could not be so deceived in any part of the Swan River district. There is an Australian atmosphere about the whole colony which no amount of foreign importation can dissipate; moreover there is a distinction between the people of the two sides which is quite marked, insomuch that an "other sider" can immediately recognise a born and bred "Westralian." We are beginning, it may be seen, to assume the right of a new people to coin new words. Nobody in the old colonies now speaks of a West-Australian, but it is a regrettable circumstance that there is a growing tendency among the colonists to mention each other in terms which, if not actually coarse and vulgar, are decidedly slangy.

When this district was first settled it was known as the Swan River Colony, a name that has stuck to it ever since,

but Westralians are beginning to resent this error in referring to what is only a district of Western Australia.

Perth is the chief town of the region and the capital of the whole colony of Western Australia. It is situated on the north bank of the Swan, which, at this point, widens out into a lake-like expanse, but the swans, the former presence of which gave the river its name, have long since been driven from the neighbourhood. Yet an occasional straggler is shot near the city; and on the upper reaches of the river, flocks of black swans were seen by me in the year 1890. Unfortunately parties of sportsmen invariably turned out in pursuit of any flock reported to be in the neighbourhood of the townships.

The old buildings of the town of Perth are fast being cleared away to make room for modern erections, which are built on a scale and in a style commensurate to the supposed future requirements of the city, and I have no doubt there are many fine buildings in the place—or will be, for several of the largest, if not finest, were in course of erection at the time of my short residence there. I cannot say that I consider Perth an imposing place. It is a remarkably compact and closely built place for an Australian town; and what is still more strange, is without a town reservation, a thing almost unheard of on the eastern side. The spot pointed out to me as "the public park" was scarcely large enough for a fowl-run.

If one may judge from the number of cathedrals and churches closely packed in the place, Perth is inhabited by a very religious community. I should think that every denomination on earth has a place of worship here, and I cannot forbear remarking that there is something ridiculous in applying the term "cathedral" to what looks, to an ordinary layman, like a very poorly designed church.

The old town-hall is worth mentioning because it is not only a large and rather majestic-looking building, but is said to have been entirely erected by convict labourers.

Turning to the flora and fauna of the district, the observing naturalist is soon struck by the difference and development of the vegetable productions from anything

of the like kind he has seen in the eastern and southern portions of the continent. Casuarinas, which in other districts are fine trees, are here usually very poor specimens of the genus—dwarfed and sickly looking. On the other hand, some characteristic plants of the west here attain their maximum degree of development. This is notably the case with the grass-tree (*Kingia australis*), which in the Swan River district is one of the most notable objects in the landscape. About Fremantle, in particular, there are remarkably fine specimens of this curious plant, some of which attain a height of seventeen or eighteen feet, though the tree does not usually grow more than ten or twelve feet high.

It is a plant, shrub, or tree (I know not which to call it) of exceedingly slow growth. The colonists say that it takes forty years to grow a foot in height. I do not know if this is an exaggeration, but I can state that plants which are known to be at least a hundred years old are not six feet high.

The shrub, at first, breaks through the soil, which is a mixture of sand and loam, or a kind of clay, as a round mass of tangled grass of coarse texture, resembling in outward appearance some huge fungus bursting forth from the ground. Very slowly, taking years in the performance of the operation, it rises above the earth, showing a thick black stem which is generally quite straight, but sometimes, with age, becomes rough, gnarled, and convoluted. Gradually the stem increases in height, and the tuft of grass-like filaments spread out and hang in a festoon over the crown of the tree. Then from the centre of this crown there springs a long black stick which stands upright, six, seven, or more feet, according to the size of the tree. Viewed from a distance the plant looks like a bushy-headed native holding his spear upright, hence the colonists call the tree the black-boy. There was formerly a dense forest of these trees along the coast near Fremantle. There are still many of the finest trees left, and the road to Rockingham is lined with them for a distance of several miles.

The wood of the grass-tree is solid, hard, and full of

resin. It burns fiercely like pine, and fires made with it blaze brightly, and crackle in a series of small explosions. It is this property of making good fires that has largely led to its destruction. I am not aware that the wood is used for any commercial or manufacturing purposes; but it seems admirably fitted for many of those purposes to which hard woods are applied.

Having resolved to make a little expedition into the interior, I began my preparations at the end of the summer, by engaging a couple of blacks and a white man as servants, and purchasing horses fit for the purposed journey. The white man, Thomas Hamblin, was an old stockman who had had great experience on the back-runs. The black-fellows, John Chuckabe and Jacky Whiteboy, were, of course, men who had long forsaken the wilds and the habits of their untamed countrymen. They had both been in the employ of stock-farmers as cattle-hunters, *i.e.*, hunters up of stray cows and bullocks which wander away sometimes, and both bore good characters for stability and willingness—great points in the disposition of a black servant.

These two natives were engaged chiefly to lead and look after the pack-horses, of which we had four, besides the four riding horses. These carried stores of tea, sugar, biscuit, tobacco, and flour for three weeks; in addition to a couple of picks, shovels, axes, and other tools, blankets and a little extra clothing, and a bottle or two of spirits and medicine.

Tea, sugar, and tobacco seem, at first sight, to be luxuries, but the influence of such articles on the health and spirits of a party travelling in the bush can only be appreciated by those who have had a bush experience. The soothing influence to the mind of tea and tobacco is of the highest importance to a party of men in the lone wilderness, and a supply of these luxuries often wards off the breakdown of men wearied with the monotony and hardship of incessantly travelling in such country as is usually characteristic of the Australian bush. The want of tobacco is especially hurtful to men who, like stockmen

and bushmen generally, habitually use it in large quantities.

I expected to pass a full month in the desert—it could scarcely be called bush in this country—but the number of miscellaneous articles it was thought desirable to take with us was so great, that the horses could not carry more than three weeks' provisions in addition to their other loads. Although no travelling party in Australia can safely depend for food on the game it may meet with, it was hoped that we should be able to eke out our supplies with such animals and birds as we might chance to shoot. Empty water-bags were also carried, to be filled and loaded on the pack-horses when the expenditure of the stores should leave them free to bear this burden, for we expected during the latter part of the journey to have some difficulty in finding water.

In every respect I endeavoured to make my little expedition as complete and well provided as my means would allow, taking with me a maximum of stores with a minimum of persons, which should be the rule with all exploring parties in Australia, where the provision of food is the chief difficulty. All being ready, I left Perth and proceeded by easy stages *viâ* York and Beverley to Darening, arriving there on the 19th April 1890.

At Darening, which is a small inland township on the explorer Lefroy's route, we made a halt for a rest and to fill up our stores to the utmost carrying capacity of the horses; and on the 24th we fairly started on our journey, not following the route of Lefroy and Hunt, but bearing off to the north-east, as I wished to open up an entirely new country.

The ground was a monotonous plain, with here and there a low sand-hill, covered with a dwarfed spinifex. A few casuarinas were scattered about, and occasionally we saw a stunted grass-tree or two; but on the whole, this was the least interesting country I had ever seen. Yet there is grass enough here to maintain a goodly number of cattle; and we passed the first night at the hut of a stock-rider who had three thousand beasts in his charge.

He told me his run extended forty miles on each side, and that he and his chums had dug innumerable wells on this area as the only means of providing the cattle with water. Directions for finding some of these wells he kindly gave me, assuring me at the same time, that there was no surface water for a hundred miles in the direction I purposed travelling, and that I should certainly be compelled to turn back. Beyond the distance mentioned he did not know the country. His information was of some value to us, and induced me to alter my course more to the northward to avoid some arid tracts he described.

There was no change in the character of the country travelled over on the 25th. At four o'clock in the afternoon we halted, and attempted to obtain water by digging. In this we failed, and the horses consequently had to go without it, the men having only what they carried in their water-bottles.

We started very early the next morning and rode fast, the search for water being an immediate necessity. By ten o'clock I conjectured that we had ridden at least forty miles over a sandy, spinifex-covered plain, with gum-trees scattered over it at almost regular intervals. Some hills to our left were dotted thickly with bushes, growing singly, not in clusters. This singularity in the disposal of bushes and trees I have noticed in an earlier chapter. For a distance of two hundred miles in this country we found the ground occupied with scattered bushes and trees, never growing in woods, groves, or even clusters, but sometimes half a mile apart, and sometimes only a score of yards. Many of the trees were leafless, and their black branches had a most weird and forlorn appearance.

Soon after ten o'clock we sighted a lake, the bright whiteness of the surface of which announced at once that it was a sheet of apparently pure salt. Near its margin we found water five feet below the surface of the ground, but it was too salt to be drunk. A few miles further on was a wet lake or swamp, the water of which was bitter as well as peculiarly briny. We accordingly rode as fast as

possible due north, urged now by the actual pangs of thirst. At three o'clock in the afternoon we found a mud-hole without a drop of water in it. By digging here we obtained a brackish fluid which was just drinkable. The horses drank it eagerly enough that night, but would not touch it in the morning.

The country was still a plain with a few hills on it at long intervals apart; but in front of us could be seen what was thought to be a range of considerable height. Water is nearly always present in or at the foot of mountains, and we pressed on eagerly the next day, anxious to reach the shade of these lonely rocks in a dry land. As we advanced it was noticed that the mountains did not seem to come nearer, and hopes were for a short time indulged that we had really discovered an important and hitherto unknown range; but when dense forests and a lake of large dimensions began to rise above the plain, the word "Mirage" simultaneously sprang from the lips of myself and Hamblin, and as the sun began to sink towards the west, mountains, forests, and lake disappeared as suddenly as they had come into view.

Early on the afternoon of this day the horses became so exhausted, especially the pack-animals, that a halt became imperatively necessary. Two of the riding animals being still serviceable, Hamblin and I rode round the country while the blacks made a fire, hobbled the horses, and prepared the evening meal.

We were at this time, I suppose, somewhere near Mount Carrall or Mount Burgess; but neither of those peaks were visible, or at least recognised. Half a dozen conical hills were in sight, having curious wall-like cliffs, near their summits, but none of them were of sufficient elevation to merit the name of Mounts. They were almost destitute of vegetation, with one exception, which was covered with scattered bushes and a few trees.

There are two species of wallaby on these plains. The hare-wallaby (*Lagorchestes leporoides*), described in Chapter VII., is by far the most abundant, and is found in parties of fifty to seventy, each party seeming to inhabit exclusively

an extensive stretch of country, so that it is not easy to obtain a heavy bag of these animals.

The other species was the short-tailed wallaby (*Macropus brachyurus*), of which only two small herds, numbering thirteen or fourteen each, were seen. Those were even wilder than the hare-wallabies, and only a single specimen was shot with a rifle at a distance of two hundred yards. Probably these animals are much harassed by the blacks, several of whose old fire-places we passed.

We could find no water; and the impatient "cooes" of the two blackboys warning us that they were alarmed at our prolonged absence, we turned towards the distant glimmering fires. It was then just getting dusk, the sun having sunk behind a cloud of deep, lowering purple and red, lying under a bank of intense black. This peculiar appearance caused Hamblin to predict that we should have a heavy rain before morning; nor was he mistaken. As we neared the camp a bustard was seen solemnly trotting across the plain at a very leisurely pace. Both Hamblin and I fired our rifles at it on an off-chance of getting an acceptable supper, but it was not hit. The raging thirst from which we both suffered prevented our eating much, but the blacks ate heartily, they having sucked the blood from a couple of wallabies we shot earlier in the day

I have much wondered how the natives find sufficient fluid to sustain life in the parched deserts of Australia: for they are often seen in the most arid parts of it, and I believe they frequently drink the blood of such animals as they kill. Both Chuckabe and Whiteboy confessed that this was the case among the West-Australian natives; and I have no doubt it is also among those of other parts of the continent. In all parts of the country, but especially in the west, they dig shallow wells with great labour. They cannot reach the water if it lies at a greater depth than eight or nine feet.

Regarding the fanciful and ridiculous names of my two servants, I may mention that it is the custom of the stockmen and squatters in all parts of the country to bestow upon the station-blacks the most absurd names

they can invent. In this nonsense they are aided and abetted by the blackfellows themselves, who are proud of their uncouth titles.

In the night between the 27th and 28th April there was a terrific thunderstorm, with streams of rain. I have thought since that quite possibly this timely downpour saved our lives; for even if we had started back at once for the settlements—and such action had already been discussed among us—it is doubtful if we could have survived the want of water so long. The horses would have broken down; and our fate would then have been that of so many unfortunate bushmen who have perished from time to time ever since the first colonists "dumped down" on our arid shores. This desert is one of the few places in Australia where even an old bushman would find his usual expedients to obtain water fail him.

But, for the hour, our plight was a trying one. The fires, of course, were extinguished, and we, lying in the open, without shelter of any kind, were drenched to the skin, through blankets and clothing, in the first ten minutes of rain. The thunder was so terrific, the lightning so appallingly brilliant, that the horses became mad with terror, and two of them contrived to break, or slip their hobbles and scampered away into the darkness. It was a night of wretchedness. The wind blew with piercing coldness from a south-west point; and the storm, I thought, came up from the sea coast. An hour before sunrise the rain ceased to fall; the wind did not moderate until nearly noon. A good deal of our stores was spoilt or damaged by the wet; but so awful is the thirst-craving, that we thought nothing for the present of losses: our hearts were too full of joy at sight, as the day broke, of the large pools of good water which were lying on the surface of the earth. The country was not flooded: far from it. But shallow pools, seldom more than three or four inches deep and an acre or more in extent, lay on the land as far as the eye could reach. Horses and men were satisfied with the precious fluid, which we perceived was soaking into the ground with a rapidity that threatened a speedy end to

our abundance. Yet it was impossible to move forward that day, unless we abandoned much valuable substance. It was desirable also to recover if possible the lost horses, which were two of the best riding animals. The boys were sent away to track them down, while Hamblin and I undid the soaked stores, and spread them out to dry. This they did in the course of the day, for the sun shone powerfully; and from the icy coldness of midnight, the temperature rose to almost tropical heat at mid-day. The land was concealed by a thick mist, arising, I suppose, from the evaporation of the surface water.

It was not until nearly sunset that Chuckabe and Whiteboy returned to the camp. They brought one horse with them; the other, as shown by its tracks, had made a straight line back in the direction we had come. It was, therefore, hopeless to think of recovering it, and consequently we had to leave about sixty pounds weight of stores behind. These were all much damaged; but they were buried in the sand, and a mark set up, in case we should have to return, though it was probable that the natives would find these goods in a very short space of time, those remarkable men having such extraordinary powers of tracking, that I believe if a pin were dropped in the desert, they might be relied on to find it.

By the next morning the ground was nearly as dry as before the fall of rain; but some of our things were still too damp to be packed, and there were other reasons which induced us to rest another day, and it was not until the morning of the 30th April that we resumed our way, still travelling in a north-east direction.

In the course of the day we passed several old water-holes or wells, which had been dug by the natives, and which were four or five feet deep and were now full to the brim. The pools of yesterday had all disappeared, leaving circular-shaped patches of mud where they had been deepest. There was nothing to denote why these depressions, which never exceeded a few inches in depth, were so uniformly of a round form; but for many miles the plain was thickly covered with these saucer-like depressions,

with here and there a deep gully with a considerable depth of water at the bottom.

Early in the morning we came to the bed of a river with sandy banks nearly seventy feet high. Water had been recently running in the bed, for it was still muddy, but it only remained in any quantity in deep holes. Some of these holes had twenty feet of water in them, and most of them at least twelve feet; so that there was no immediate fear of our again running short of this necessary.

The downward course of this river was toward the north-east; but just above where we struck it, it trended almost due east, indicating that its head was somewhere in the central desert. I therefore determined to follow its upward course. This, however, soon proved to be very tortuous, though the water-holes were found at frequent intervals, some of them a hundred yards long, about twenty broad, and twelve or more feet deep, with remarkably pure and sweet water. Gradually these water-holes became less frequent and were smaller, some containing scarcely any water and some being mere mud-wells. By and by we found some holes which had been widened by stockmen or other whites and the sides revetted with hurdles made of brush-wood to prevent the weight of cattle breaking them down.

Soon after, on the plain near the river, we found the remains of stock-yard railings enclosing large areas of ground. Some of the paddocks were hundreds of acres in extent, most of the rails still standing, though there were gaps caused by decay; and the natives seemed to have been there and done some mischief. Probably they had carried away the boards of several huts, the sites of which were plainly marked on the ground.

Here, no doubt, had formerly lived an out-lying settler; but Hamblin and the boys knew nothing of this part of the country, and had not heard of any squatter in this far-away spot. What had led the lonely adventurer to forsake his desert home can only be conjectured. Possibly a year of exceptional drought had ruined him

or induced him to seek a new home; or the blackfellows may have been troublesome. The skulls and bones of cattle, horses, and sheep were seen lying about the enclosures, but not in sufficient numbers to suggest a disaster.

The wood of the railings being handy for making fires, we stopped here for the night; and during the hours of darkness we several times heard the desert savages prowling about our camp, the loose sand and gravel giving forth a crunching sound under their tread, which all their caution failed to avoid; and my own boys, still in possession of their acute savage faculties, recognised by other signs that a party of nearly twenty natives were creeping around the camp. It was, consequently, a night of watchful anxiety to us, as spears might have been thrown at any moment. To avoid the danger as much as possible, we moved away from the immediate neighbourhood of the fire, as its light must have shown us plainly to the prowlers.

No attack was made, fortunately, and when daylight came nothing could be seen of our midnight visitors. They had quietly disappeared without doing us any harm.

CHAPTER XV

RAMBLES IN THE DESERT

THE 1st May was a very hot day, and the sky was quite cloudless. Chuckabe found the tracks of about twenty natives who had been prowling round the camp, and these had gone off towards the east, the direction we wished to take. During the forenoon we sighted fifteen of them standing and watching us from the distance of about a mile. They appeared quite suddenly from a hollow place or gully. As it was highly desirable to be on friendly terms with these wild fellows, I made peaceable signals to them, and after a time they came up to us. Some of them had been in the townships about the course of the Swan; and one said he had been to Perth. He showed a clasp-knife which he had obtained there in confirmation of his assertion; and some of the others had articles which must have been purchased, or purloined, at the settlements.

Those of the blacks who had been in communication with the whites at the townships were disposed to be friendly; the others were not so, and were guilty of behaviour which greatly tried our patience. They begged incessantly; and to win their goodwill I gave them several articles which were really of more use to us than to them. One fellow was particularly covetous, and not content with what I had given him, wanted my gun in addition; and this being repeatedly refused, at length he seized it, and tried to wrench it from my hands. To prevent his doing so, I was compelled to knock him down, and this necessary violence gave great offence to

some of his comrades; and for a moment I feared that unpleasant consequences would ensue. But those blacks who had been among the whites of Swan River took my part, saying that the fellow had only got what he deserved. The majority took this view, and we became friendly all round, even the fellow I had punished professing friendship for me.

The whole party moved on with us; and afterwards I saw about twenty women and children following behind, but no more men appeared. Those with us were armed with spears and throwing sticks, and some had waddies (a kind of club); and the women, I could see, were carrying bundles of spears. But I did not think this a suspicious circumstance, as the natives always go armed; and, indeed, must do so in the desert, as they live on that which they can catch or slay.

The women did not attempt to come up to us, but kept a long way off, until I inquired the reason. I then heard that some of the women, on a former occasion, had received attentions from a party of wandering stock-riders which had excited the jealousy, or mistrust, of their relatives. On my assuring the men that the women should not be molested, they were called up, and on my giving the children a few presents, the whole party ceased to be troublesome; satisfied at length, I suppose, that I felt nothing but goodwill towards them.

The poor women were pitiable-looking specimens of their sex; but some of the young children were pretty little things, with bright, intelligent-looking eyes. With the exception of one old woman, all the females had a few rags fastened round them; but the men and the children were quite naked. One woman had a kind of apron made of the skin of an emu with the feathers still on, and another had the hide of a large wallaby thrown over her shoulders. The miserable clothing of the others consisted of linen rags and fragments of old blankets which must have been obtained from white people, the whole of the rags being in a disgustingly filthy state.

This tribe followed us for about eight miles, and parted

from us with expressions of friendship. No true naturalist can fail to be interested in the ways and habits of the natives of a wild country; and, as it is always best to concentrate and keep together as much as possible information on one particular subject, I have devoted a chapter (XX.) to a description of the Australian blackfellow, in which I hope the ethnologist will find something that is new; or at least a few corrections of hasty and ill-informed descriptions of him. For all that I have read about the Australian aborigine is not to be relied on; and without presuming to contradict the accounts of those whose work and sufferings in the trying interior of our great continent entitle them to a reverential hearing, I have striven to give a truthful picture of a doomed race as it has appeared to my eyes.

Such a journey as that which I am now describing would, fifty or sixty years ago, have attracted some attention; but in 1890 a ramble of a few hundred miles in the back-runs, the bush, or the desert interior, was an everyday occurrence in all parts of the country. With the experience of the early explorers and hundreds of others who had afterwards followed in their tracks to guide me, the journey was robbed of nine-tenths of its danger and all its importance, and at Perth I was scarcely asked what I was doing or where I was going; and though at the outlying stations some interest was evinced in my movements, it was not thought that I should, or could, reach any tract that had not been repeatedly passed through and become more or less well known, in general features at least. Travelling in Australia has lost all its romance and most of its danger. Scarcely had such men as Sturt and Eyre completed their heroic work at the cost, too often, of life, sight, or health, than scores of daring traders, known as the Overlanders, not only performed similarly arduous journeys, but took great herds of sheep and cattle with them. Early in 1838 two expeditions respectively under the direction of Messrs Eyre and Howden started from Port Phillip to endeavour to reach Adelaide, South Australia. The success of their expeditions, and the high

price cattle were then fetching in the South Australian capital, induced a number of enterprising stockmen (most of whom were gentlemen by birth and education) to endeavour to drive their herds overland (hence the sobriquet bestowed on them) from one capital to the other. Immediately after the completion of Eyre's journey, one of these Overlanders took a herd of several thousand cattle from Melbourne to Adelaide, realising a small fortune by the exploit; and according to Sir George (then Captain) Grey, in little more than a year from that time, sheep and cattle to the value of £230,000 had been driven into South Australia by the Overland route. The distance travelled over was often quite nine hundred miles, and the difficulties of the journey are indescribable in a paragraph, or, indeed, in a chapter. Many years since the Overland route was superseded by other and quicker means of transport, and the incident is only noticed to show how speedily, when once the country became known, the difficulties and dangers of Australian travel could be overcome by enterprising and adventurous men.

Even so, in these modern days, a journey in the interior that a few decades ago would have perhaps cost a life or two, and would, at any rate, have been performed only with great suffering and deliberate slowness, excites no interest unless the declared object of the traveller is some particular discovery which may prove a source of gain. If he is "on the track of gold," or even of a rich back-run, a thousand pairs of eyes witness his start, a thousand tongues wish him good luck; but let it be understood that he is only desirous of seeing the country and hunting for birds and plants, and, with a thousand vile expletives, he is declared to be a fool, and all interest in him and his movements is instantly extinguished. Thus it came to pass that though the journey I am now describing cost me money, time, and suffering, yet it was a mere ramble. I was told that enough was known of the centre of the continent to satisfy ordinary minds, that I should never succeed in reaching it with my small party, and if I did, the feat had been performed so frequently that nobody

would be interested in another person repeating it, unless *he did it for a wager.*

All this I now *believe* to be quite true, and the assertion that I should not succeed in reaching the centre of the continent I *know* to be so. Within a week of starting I perceived that I should risk life if I persisted in pushing on in a north-east direction with such a scanty supply of food as that I had provided. I therefore turned due north, determined to make for the coast and the settlements the moment the food-supply threatened to fall short of our requirement.

We followed the course of the river-bed mentioned in the last chapter for a distance of about sixty miles. All the way we found the banks high, varying from forty to seventy feet, while the bed itself was composed of white sand with here and there streaks of a reddish-brown colour, occasioned by some soil which had been washed into it. The bed was full of holes, now containing water from the recent storm-burst, and most of them were swarming with fish of small size; but as we had no means of catching any, I cannot tell with certainty the species. Eels, however, were amongst them, and a few of these were obtained from the mud. Everywhere the sand of the bed concealed a kind of light-coloured mud which held the water, and we could obtain this in any quantity we wished by scraping a shallow hole, into which it immediately flowed. All the river-beds of this district are alike in this respect; but as they become drier, the water lies lower. It is only in exceptionally dry seasons that it cannot be obtained at a depth of seven or eight feet at most; and I am convinced that all the larger streams at least, have an underground course, as is said to be the case with many of those in the eastern deserts of America and other parts of the world. That there is a large body of water under the beds of these rivers is proved by the rapidity with which they fill on the fall of rain, showing that they have not to absorb a large quantity before becoming saturated. On the plains the rain is absorbed much more rapidly; indeed a fall of less than two or three inches is not sufficient to form pools

and keep the ground moist for longer than four or five hours.

I cannot satisfactorily account for the formation of so many holes in the beds of Australian rivers. These holes, which are not of the nature of "pot-holes," are not found so frequently in large rivers like the Murray and Darling, which have always some water in their beds. But in some of the rivers on this eastern side of the continent there are hundreds of these holes, large and small. Some which are only a few yards in length and breadth are more than twenty feet deep, and one on this river was as much as fifty feet deep, though only forty yards long and about half that measurement in breadth. How could such holes be formed? I suspect subsidence, the result of the underground action of water.

What river this could be I know not. It was probably a channel rather than a river, and never possessed of a surface current except after heavy rains. It cannot have an independent outlet on the sea-coast, and is probably lost in one of the great lakes or marshes in the neighbourhood of Lake Moore, or perhaps it takes a due north course to the great inland marsh of Austin. North-east of my position on 1st May, the map indicated that there are many large lakes or marshes, nearly all of which are salt, and probably, like the rivers, only wet during the prevalence of rains. I myself saw enough of the country to convince me that there is a very considerable stretch of marsh land in this direction. In summer-time it is either quite dry or a succession of mud-ponds; but I am convinced that, the right time of the year being chosen, it would not be the want of water which would prevent a traveller from easily reaching the centre of the continent by this route. Properly and sufficiently provided, I am convinced that an experienced bushman could, in these days, with ease cross the country from coast to coast.

As on this 1st May we were probably on ground which was rarely crossed over by white men, I consider that it is the real starting-point of my journey. Here, at any rate, I felt that I was on new ground, and though

the journey was a mere ramble, and never intended or considered as anything else, I felt sorry at the time that I had not brought a few instruments to enable me to fix points on my route. As it is, I can only state the position approximately. We were probably halting on the date named at about 120.30 E. by 30 S., and were consequently more than two hundred miles north-east of Perth.

The only ground animals seen so far were the wallabies already mentioned and a rat, but there was a tolerably good number of birds about this part of the river bed. At our last halting-place on it (2nd May) several emus and many smaller birds came to a water-hole just above our camp to drink. The emus were very shy, but I shot one with my rifle at a distance of three hundred yards. A nearer approach to them I found to be impossible. As I advanced they moved away, keeping to the now dry bed of the river, and at length I fired, fearful of losing the chance of a shot at them. This emu (*D. irroratus*) was eaten and greatly relished by the two blacks. It seemed to me to be a very light bird for its size. Of course I had no means of weighing it, but by guess I thought it did not exceed forty pounds. It was a cock bird, and the flesh on its breast and thighs—and there was very little on other parts—was scarcely better than a mass of tough sinews.

Two more shots were obtained at emus, but at ranges which were too great for our marksmanship. Some of the smaller birds fell victims to our necessity, and the most remarkable of these was a species of brush-turkey—the megapode (*Lipoa ocellata*). This bird, in size rather larger than a common pheasant, is of special interest on account of the huge mounds it raises to serve as nests. On the 2nd May we passed through a tract of country in which there were many of these mounds, sometimes placed in groups and sometimes scattered over the face of the country. The birds were also plentiful, but not quite so easy to shoot as some observers have stated, but there is no doubt that the natives had recently been

much worrying the game of this district. The birds ran very fast, not readily taking to the wing, and when they did so, flying but a short distance to the nearest patch of thick brush, where they easily escaped by running. Altogether we shot about two dozen in three days, and found them very palatable food.

It is usually stated that the eggs, which are buried in the mounds, are hatched by the heat engendered by the fermentation of the vegetation of which they are constructed, but I think that the heat of the sun is the real vivifyer.

The mounds seen here were of many sizes, the largest being five feet high and twenty-seven in circumference at the base. Others were three and four feet high and eight in diameter, and the smallest about two feet high and five in diameter. As I have seen the mounds of this and other species in many different parts of the country and watched the birds at work, it may not be out of place to give a detailed account of them, though for a long time naturalists have been well acquainted with the ways and habits of all the species; indeed, in many parts of the country the bird is so well known that it has been exterminated, by which remark I mean to convey a rebuke rather than a bit of humour.

The bird works something like a scratching hen, but such substances as grass, etc., are actually grasped in the powerful claws and thrown forcibly backwards, sometimes a distance of several feet. The bird can throw grass and leaves to the top of mounds, which are four or five feet high, though substances are also scratched up the slopes of them. When a new mound is commenced, eggs are laid in it when it is only sixteen or eighteen inches high, and perhaps not more than four feet in diameter. The egg is placed on end, surrounded with a thick layer of grass, leaves, and loose weeds, and the whole buried about two feet deep. Perhaps as many as six or eight eggs are placed in a layer at the same depth, and it is often asserted that another layer is placed over the first. I very much doubt the correctness of this opinion, but the

number of eggs found in a mound differs very remarkably, and can only be accounted for by another fact, which is often disputed, viz., that several birds lay in the same mound. I am convinced that this is the case, although I have not been able to verify it. The number of eggs laid by each bird I believe to be very small, but they lay for quite eight months in each year—the species now under description from the latter part of July to March, but the time varies a little with the locality. I have generally found eight or ten eggs in a nest, but sometimes there are five or six times that number. I once took sixty-five from a large mound, and it is obvious that one bird could not lay so many; besides, there is a long interval between the laying of each egg, I believe about twenty days. Consequently in the breeding season there are always both young and eggs in the mound, and the reason that this is not more generally observed by naturalists is because the young make their escape when the mound is approached. If the observer wishes to see them he must advance very cautiously.

There is always much more earth and sand than vegetable matter in the composition of a mound, which should be called a nest, for such it really is; and these nests are a remarkable instance of natural mimicry, for they so well resemble ant-hills that they have often been mistaken for the habitations of those industrious insects, especially as ants generally abound on and about them—a remarkable natural provision for the young birds, which feed on them. Much of the vegetable matter used in the construction of the nests takes fresh root in the mound, and seeds germinate, so that there is usually much living herbage at the base of the nests, and some of them are quite concealed by growing plants. Sometimes, too, the nest is placed round the roots of a tree so that the trunk seems to be growing from the centre of it.

Much further to the north, in the Port Darwin district, there is another species, well marked by its prominent pointed crest (*Megapodius tumulus*), which uses sand and earth (a kind of loam often found in the sandy districts of

Australia) in the composition of its nest, the eggs only being enveloped with an inch or two of herbage or grass. But the general breeding habits are alike in both these western species. The eggs are always placed end upwards, never laid laterally like those of other birds; and they are embedded firmly in the mass of nest materials. A period of sixty to sixty-five days elapses before the chick is hatched, and both parents assist to unearth it, the chick also burrowing upwards, or outwards, according to its position in the mound; and it seems to be the noise it makes in its endeavour to escape that notifies to the old birds that it is ready to come forth. A tunnel or burrow is thus made by the passage of the chick to the surface, and in this it continues to live and hide for a considerable time—in fact, until it becomes too large to use the hole conveniently.

From the moment it is hatched the chick can feed itself, run rapidly, and scratch with vigour. It seems to be fully aware that the nest is no protection to it against the attacks of men and dogs (dingoes), and on the approach of either of these enemies, it quietly skulks away into the densest scrub in the neighbourhood, where neither dogs nor natives seem to be able to track it.

Observations made on many captive pairs kept in public gardens on the eastern side of the continent do not tally with the above remarks; and I am convinced that captivity has a marked influence in causing variation in the habits of animals, especially their breeding habits. Captive animals are never in a perfect state of health, as is shown by the fading of the colours if not of the plumage of birds, of the ceres, skin of the legs and feet, combs, wattles, etc., and other signs. However opinions may differ on such points, it is certain that megapodes and brush-turkeys in captivity, even in their native country, do not breed so freely or with the regularity of the wild birds.

The eggs of these birds are not the least remarkable point in their natural economy. They are simply enormous compared with the size of the bird which

lays them. Those of the species found in what I call the Swan River district, though the bird is no bigger than a small hen, are about three inches and a quarter in length and seven inches in circumference; and this great size is another bit of evidence against the number of eggs laid by one bird being very large. The colour of the eggs of all the species is pure white; but they are encrusted with a thin layer of a chalky matter similar to that found on the eggs of some other families of birds widely removed from the present; and this layer often becomes tinged with colour derived from the weeds and earth with which the nest-mound is built.

The eggs are eagerly sought after by both natives and colonists for food; and this is a potent cause of the destruction of the birds. I have seen natives bring a hundred of these eggs at a time to a township or a settler's wife, receiving in return a quantity of necessaries that made him in his own eyes and those of his companions a rich man. The blacks are always sure of a good market for these eggs, and the wonder is that the birds are not already exterminated, seeing that it is impossible for them to hide their remarkable nests from the all-seeing and all-finding instincts of the aborigine.

The habits, in some respects, of the various species of megapodes vary. Some are more gregarious than others. The species found in the extreme north-west goes in much smaller parties than that found by us in this district. Here the bird is found in scattered flocks, which rarely collect close together. As many as a dozen may be seen on one tree, or near one nest; but possibly there are forty or fifty in the neighbourhood. An odd pair or two, or a single bird, may often be met with. In the north it is seldom that more than seven or eight birds are found together, and pairs are the rule. It seems that each pair keeps to a selected spot of no great extent, and seldom wanders far from it. The fact that many nests are found grouped together is of no significance, many of the nests being old and disused. One or more hens frequent the same mound year after year, until it becomes too large

and high for further service, when a fresh nest is commenced in immediate proximity to the first, unless the birds have been much disturbed. A nest-mound seems to be used for ten or twelve years, by which time it has become too large for further additions. Each season's eggs are laid on the mound, and covered with fresh materials; they are never buried in the old earth. Consequently the nest is increased in size each year until it sometimes contains quite sixty cubic feet of rubbish. This means that a small flock of these industrious birds add three or four hundredweight of material to their nest every year!—a truly wonderful performance.

The breeding season was over with the birds we found in the neighbourhood of our nameless river-bed. There were many young chicks, which ran about like little partridges or quails, but no eggs. I broke down several of the mounds, but only found one egg, and that was addled and much discoloured with age. By running quickly the chicks could be caught, as they only rise on the wing with difficulty. They were very strong, and perfectly developed, though not so large as common pigeons; and even at the time of hatching, these little things are fully feathered, and not covered with down like most young birds.

The megapodes have several characteristic habits. When alarmed they stretch out their necks straight in front of them and remain perfectly still, appearing as if in a catalepsy. If the danger approaches nearer, they either run with rapidity to the nearest cover or rise on the wing. In the latter case they never fly far, and they always seem to be very weak on the wing. They occasionally alight on trees, always choosing the lower branches to perch on; and I do not remember to have seen one of these birds on the top of a tall tree. They love best to hide in thick scrub, and there they scratch and feed much like domestic fowls. In fact they are nearly always scratching, and they frequently lie in the loose sand fluttering their wings and shaking their feathers in great enjoyment. The food of the species I have been describ-

ing consists of insects of all kinds—snails, slugs, and earthworms, some of the latter, obtained in damp places, being of great size. All sorts of seeds and fruits are also eaten by it, and the food of all the other species is similar; but the brush-turkeys of the east side of the continent are, I think, more frugivorous than the megapodes.

These birds have many different notes and calls, an idea of which it is almost impossible to convey by means of words. The sounds most often heard are a loud, harsh, detached note, quickly repeated, and a low murmuring sound, which seems to be a note of affection or love. The cries cannot be compared to those of any other bird that I know of.

The banks of the river are so high that it is impossible that it can ever contain sufficient water to overflow them. Yet a grove of trees grows on each side of the upper course, attracted by the moisture. This grove is a mile across in some places, and the trees are so matted together with scrub and a kind of cane or reed, that we could not get through it without cutting a passage for the horses.

While we were engaged in this work I again heard the cuckoo, mentioned in the last chapter, and this time I succeeded in obtaining a view of the bird. It was a small, dull-coloured bird, with a plumage of greys and browns; and though I can neither identify it nor declare positively that it was a cuckoo, there is no doubt about the note. Though not precisely similar to that of the common cuckoo, the call is so nearly like it that the bird is known to the colonists as "the cuckoo." I have heard many of the men speak of the bird, which is well known in the Swan River district, but I never obtained a specimen; nor can I find it described in any work on Australia. According to several books I have consulted, the Australian cuckoo has not the characteristic note of its family. This, I think, is a mistake, at any rate there is a bird on the western side of Australia with a note so cuckoo-like that it deceives all who hear it.

Several small finches were seen here; but as no small

birds were shot, I could not positively identify the species except in one or two cases.

Following a nearly due north course, we found the country more freely sprinkled with trees than that part of it passed over during the first stages of our journey, and these sometimes were clustered together in woods or groves from a few score yards to a mile or two in width. It was always difficult to pass through these belts of trees, they were so thickly under-scrubbed. Sometimes we passed through patches of scrub composed of a kind of cane or tough reed, with an almost arborial growth, and rising from a dense mass of herbage eight feet high. This and the tree-belts proved such an impediment, that on the 3rd May we did not advance more than ten miles in as many hours. It was as much as a man could do to force his way through this scrub, and the pack-horses could not pass until an opening had been cut for them. This work entailed on us severe labour, and much loss of time.

On the morning of the 4th May the country appeared to be a flat plain on all sides of us, with scattered trees, small groves, and patches of dense scrub. Looking due north the horizon appeared as a nearly level line ; towards the east it was also flat, with a solitary peak at a great distance. This hill was probably several hundred feet high, and was a very prominent object in so flat a country. Behind us, to the south-west, a line of hills with low cliffs near the tops could be seen. These we had passed near to four days previously, and their apparent distance seemed to indicate that we had not advanced so rapidly as we had thought ; but hills of moderate height are visible a very great way on these level plains.

CHAPTER XVI

CONTINUATION OF THE RAMBLES TO CHAMPION BAY

Our journey was as monotonous as the country we passed through. Few incidents occurred, and the ground scarcely varied in character for several days. Several more dry water-course beds were passed over, all of them having water-holes, from which we obtained a supply for our daily needs. The appearance of all these beds was similar—they differed only in size. The banks were steep and high, a kind of sandstone cropping out in many places, and the beds were composed of tenacious mud covered with a layer, several inches thick, of white sand. At this time the mud was fully saturated with water, and it was only necessary to scrape a shallow hole and wait a few minutes and an abundant supply would collect, and this water was so good that we rarely went out of our way to look for a water-hole, especially as it was troublesome to get the water from the latter, which had already begun to shrink.

The two kinds of wallaby described further back still inhabited the country, the hare-wallaby being much the more numerous. We shot several for our subsistence, and also a few birds. Yet animal life was not abundant. Wide stretches of the plain were sometimes crossed without our seeing anything with life in it, except a hawk, or a few small birds. Now and then an emu or two came in sight, but never approached near to us, and sometimes an entire day passed without our seeing a wallaby.

On the 5th there were two showers of rain which caused a delightful odour to rise from the aromatic

herbage of the plain, and we thought the country was already beginning to show signs of having benefited by recent showers. There were a few flowers amongst the grass and scrub, and we passed some trees bearing biu-nuts. These are a wholesome food if roasted in the ashes of the fire, but they are very apt to induce sickness if eaten raw. Large quantities of them are gathered for food by the natives, who in this miserable desert are compelled to eat everything they can swallow that is not positively poisonous.

On this day we saw a party of nine native men, who followed us for several miles. Thinking they might be desirous of communicating with us, I rode back towards them. They halted until I got within four hundred yards of them, when one fellow threw a spear towards me, either as a challenge, or to intimidate me. This show of offensiveness placed me in an awkward predicament. If I retreated it would be interpreted as a sign of fear, and provoke an attack; if I rode on I should perhaps be transfixed by one of their murderous weapons.

I decided, on the spur of the moment, that it would be better to take the latter risk, as nothing is more fatal to the safety of a small party than permitting the blacks to intimidate it. To show my friendly intentions I waved a white handkerchief, and rode on without checking my pace. The blacks immediately ran quickly to the shelter of some small fragments of rock which were scattered about this part of the plain. I was thus compelled to halt, as to have ridden amongst an enemy I could not see would certainly have resulted in my being speared. So I halted, dismounted, and placed a piece of tobacco and a pipe on a rock, and then rode after my party at a walking pace, glancing back to see how the blacks would take my attempt at propitiation. The weed has a wonderfully soothing effect on men's minds. I saw the blackfellows come forth from their skulking-places and examine my present. They appeared to be disputing about the possession of it, but none of them attempted to follow me, and I thought it good to take

advantage of their preoccupation, and get away as quickly as possible.

That night we halted in the bed of a small stream, the pools of which swarmed with frogs, and during the hours of darkness we heard, not for the first time, the howling of dingoes. We knew that these animals must be found in this district; but we saw or heard but very little of them. Some came quite close to the camp during the night, but we could not see them distinctly enough to obtain a shot. They had obtained prey of some kind on the bank above us, for we could hear the crunching of bones in their powerful jaws, and much squabbling and snarling over the bones of contention. At daybreak on the 6th, an unfortunate emu, which had come into the hollow to drink, fell before our guns—the second slain during our journey. This bird was much heavier than the first one shot, and it was as full of rank fat as a goose.

From this point there is more difference in the natural features in the country than we had noticed in the region already passed through. Trees grow in clusters and groves, but there is no continuous forest, and the wooded patches of land are divided by tracts of great sterility, consisting of sand, a kind of coarse gravel, and bare rock. It is useless to dig here for water; the soil is quite dry to a great depth; but there are several beds of streams at no great interval apart. All the rivers of this district are evidently dry during the greater part of the year; perhaps it would be accurate to say that the only times they have water in them for a few days or hours at a time is during the prevalence of heavy rains.

On the sandy tracts there is a scanty vegetation, consisting of woods, leafless trees, and a kind of coarse, wiry grass, that is so tough that it will bear a strong pull without breaking. This ground was over-run with rats of two kinds, which were troublesome, for they gnawed our clothing during the night, and also got at our biscuit bag. One species of these troublesome little rodents was *Mus fuscipes*, the common brown-footed rat; the other seems to

be a variety of the Queensland rat (*Xeromys myoides*). It agrees with that species in most points except size, it being much smaller than the Queensland kind. Both these rats (perhaps the last named is a mouse) are numerous in this country, sometimes being found in what seemed to be colonies. They live in holes in the earth, and are omnivorous.

In the scrub near the woods the jumping rat (*Hapalotis* genus: I am not sure of the species) is numerous but local. None were seen until we had certainly passed the 28th latitude. Then we saw patches of scrub jungle in which they swarmed, jumping away from before us like huge grasshoppers. Many leaped at least thirteen or fourteen feet, rising six or seven in the air. This animal also lives in colonies; for, after passing through a patch of jungle, perhaps a mile wide, which was alive with them, we would see no more for several days. Where there was one there was sure to be many. This rat was about seven inches long, exclusive of the tail, of a fawn colour, and not pouched. It inhabited the thickest scrub, and waited until almost trodden on before taking its leap. Then perhaps half a dozen sprang together into the air all in different directions, and with such startling suddenness that the horses were rendered restless, and with angry snorts intimated their dislike of the active little rodents.

The birds in this part of the country were very numerous, including cockatoos, parrots, pigeons, and hawks, with ducks and other water-fowl near the water-holes at night-time. In the morning the ducks were seen flying northward and north-eastward in flocks of twenty to three or four hundred, which led us to think there must be lakes or marshes in the country in those directions. Why they should come to pass the night in dry river-beds, where there were only a few small water-holes, I cannot conjecture; but they did so. They were so shy that during the whole journey we only succeeded in shooting four or five, and these were surprised in the dusk of evening. On one occasion I heard them flying

and whistling over-head, and, firing several shots at random, brought down one bird. We were so short of fresh meat that we were glad to eat anything we could procure, and many small animals were roasted at our nightly camp-fires.

There was heavy rain on the 6th, followed by an evening of lovely serenity, the sun-setting amidst extraordinary-looking clouds of the most vivid red, yellow, and green tints, which, as darkness set in, gradually merged into a deep purple colour.

We passed the night in a gully which was nearly a hundred yards deep, with water trickling at the bottom. This spot was a frog's paradise, and there were no fewer than six species in the gully, viz., the "bull frog," which is a creature of very different size and appearance from the batrachian bearing the same title in America; a yellowish-brown frog; another of a tawny colour, with dark spots; a bright green; and one of grey colour. There was also a very small species, with bright reddish-brown markings.

Probably attracted by the abundance of food, the gully was also resorted to by many snakes, the most remarkable of which is the "jumping snake" of Westralians. This seems to be a lizard of the *Seps* type, and it is certainly one of the most notable of a notable genus. The finest specimen I could find was less than a foot in length, and the usual length is about nine inches. It has a single pair of well-developed legs, with five toes to each foot, placed near the vent, and these legs are nearly two inches long. No siren or amphisbæna with which I am acquainted has such well-developed legs, nor do I know of any that can use these very small appendages as a spring to leap withal; but the jumping snake is capable of springing a distance of five feet, and a height of two or three; in fact, it is quite as active as the most agile of Australian frogs. In colour this lizard is of a dingy black or dark grey, with greenish shades, and lighter tint beneath. The legs are a dirty flesh colour inside and greenish outside, the eyes small and bright, and the head and body those of a snake,

showing clearly how nearly the lizards and snakes are related in an evolutionary point of view. Of the habits of this extraordinary reptile I had not here an opportunity of learning anything. There seem to be two or three species of these jumping snakes inhabiting the western side of the continent, but in many places they are very scarce animals, and all I was ever able to learn with exactitude about their daily life was that their food consists mainly of soft-bodied animals, such as slugs, worms, and grasshoppers. They are quite harmless creatures.

The black snake was the species which here attracted most attention, because it is the most dangerous of the western snakes. Those seen here were about four feet long, and before we left one was seen to capture a frog and swallow it.

The 7th was a bright, fine day, and the atmosphere hot during the middle hours. Early in the morning as many as fifty-seven natives were seen at the distance of two miles. As soon as they perceived us they came up with great confidence, several running on ahead of the main body making friendly signals. At first I was doubtful if it were wise to permit so large a body to surround us, but when I saw that more than half of the party consisted of women, some of them with babies slung to their backs, my alarm subsided. This tribe was very friendly, and seemed much pleased with the few small presents I gave them. They appeared to be better fed than most of the aborigines of this district. One very old man was blind, and it was astonishing to witness the skill and ease with which he moved about, avoiding obstacles with as much facility as the best sighted of his companions. I was glad to see that his fellows were kind to him, for there can be no doubt it is a prevalent custom among the blacks to destroy old people, cripples and others, who become a burden to the tribe.

These people had been much in intercourse with the colonists in various parts of the coast district, and had evidently benefited by the association. They possessed many useful articles, which had been given to them; and

it is pleasing to know that the whites of this side of the continent seem to be on very good terms with the blacks. In the townships, I may mention, there are many amiable people who are most anxious to benefit and raise morally the poor wanderers of the bush, not the least active of whom are certain missionaries, who devote their whole time to the attempted redemption of the savage, and who deserve all the help and encouragement they get from those placed in authority in the land. The great strength of this particular tribe (for it is but rarely that as many as fifty or sixty adult blacks are found in one party) was quite possibly owing to the influence of some of these gentlemen who may have induced them to spare their aged members and young children, for infanticide is quite common among them in seasons of adversity.

The tribe remained with us nearly all day, and explained, when we parted company, that they could not go any further without trespassing on the territory of another party, a thing that all the aborigines are very careful to avoid.

We travelled this day across a sandy plain where the bush was very thick, but trees were again scarce, and we found no water. We had sufficient, however, in our skin bags to meet the requirements of the day; and we passed the night on a hill which, though probably not a hundred and fifty feet high, had appeared to us for many hours before reaching it as quite a mountain. From its summit we could perceive many other elevations to the eastward, which gradually trended downwards to the north, where they merged with the plain.

At the foot of this hill we saw several "barking-lizards," as the colonists call them, pretty little reptiles of a bright black colour, with blue and purplish and green reflections. They are only seven or eight inches long, exclusive of the tail, and are remarkable for uttering the sound of a cry. This, though not very loud, might easily be mistaken for the barking of a toy-terrier or other small dog, hence the popular name the colonists have bestowed on it.

Until this day we had not met with any iguanas, although it was known that those reptiles inhabit all this part of Australia. But on the 8th several were seen and shot, as they are excellent food. They were small, however, none of them three feet long. According to works on natural history, these reptiles favour marshes and wet localities for their haunts. Here, however, they are found quite as often in dry, arid situations, which are miles away from water; yet there is no doubt they are aquatic in their general habits. They swim gracefully and well, and can run on dry land with great rapidity. But the iguanas and other creatures seen during the remainder of this ramble must have a chapter devoted to their description. For they are so many in number that I feel I must omit mention of some of the most interesting if I pause to describe them at the moment of finding them.

The time had now arrived when it was necessary to decide on a homeward course. I supposed our position to be about 300 miles from the coast, almost abreast of Champion Bay, and I had the choice of returning to the Swan River district or turning due west for Geraldton. The latter seemed to be the wisest and safest route to now take; for the stores were running short, and to return to Perth would compel us to again pass through a trying, if not a dangerous country. I quickly decided for Champion Bay and Port Grey, and on the 9th May we turned our horses' heads due west.

The day broke overcast and cloudy, and a cold drizzling rain set in and lasted till noon. At that hour a strong wind began to blow straight in our faces, and although this drove back the clouds and we had a bright afternoon we all felt the cold acutely.

Two small parties of natives were seen during the day, but neither of them came near us. One lot, consisting of three men and two women with children, had a couple of dogs with them; and I have forgotten to mention that some of the parties previously met with had a dingo or two following them. Neither of these parties came up to

us, and though they could not fail to see us, one lot did not so much as stand to watch, or, as far as could be seen, glance towards us. But they are strange people are these blackfellows, wayward and uncertain in their actions, often treacherous, but rarely ungrateful or unfaithful to those they know well and who have been kind to them.

On the 10th we passed several dry salt lakes, which were only moist near their centres. One of these was two miles wide, and had the bed of a small stream running into it. There was water in the holes in this bed, but notwithstanding the quantity of rain which had recently fallen, the country generally was very dry. We camped on the open plain under shelter of a few stunted casuarinas, and found water by digging at a depth of eight feet. From this day, during the remainder of the journey, we were never short of water, but obtained it either from water holes, or by digging. It was generally found at a depth of seven or eight feet, but there are some extensive tracts in this district in which it cannot be obtained by a use of the spade, for it is certain that if it does not collect at a reachable depth in the wet season there cannot be any near the surface of the ground in the hot, dry summer, when even a chance shower can hardly be expected.

Very few wallabies were now met with, but there were plenty of birds, chiefly parrots, cockatoos and finches, with ducks on the great marsh we reached on the 11th. Parrots and cockatoos were shot for food, but the ducks were exceedingly wild. Only the largest birds we could see were shot at, for the ammunition was beginning to run short, the original stock having been small on account of its weight.

The great marsh referred to above must be that which was discovered by Austin, but where we came to it, it was passable without difficulty. Much of it was dry salt pans, and no drinkable water was obtained here, that which oozed into the wells we dug being too salt or brackish to be used. Clearly this district is what in the western part of America would be called "a sink." We saw the beds of several small rivers which run into it, but they probably

discharge more water underground than above. The beds have lost their high banks long before they reach the marsh, and where we crossed them are very shallow, showing that the water can rarely or never rise to a height of five feet. Many miles of the country was covered with reeds in which "black snakes" and "whip-snakes," as the colonists call them, were dangerously numerous, for both these species are very poisonous.

Looking westward we saw some higher ground, of cliff-like appearance, with a few prominent elevations, two of which we took to be the East and the West Mount Magnets, but which were probably West Mount Magnet and Farmer's Mount. The country between these elevations was sterile, with but few trees on it, and nearly abandoned altogether by living creatures, but on the ridge of some hills we found a couple of moloch lizards, known on the west side as "mountain devils." They were basking in the sun, and according to the report of the blackboys, who found numerous tracks of these strange creatures, they must be abundant here.

On the 11th we crossed a ridge of low hills, with cliffs on the north-east side, which were covered with native drawings, or devices. Similar drawings had been seen on the vertical portion of some of the rocks enclosing the river beds, but here they were more numerous and elaborate in design, representing native scenes, hunts, and corroborees, and also animals, birds, fish, and even insects, with wonderful accuracy, although with great roughness of execution. From these drawings we perceived that there must be several animals in the country we had passed through which we had not met with. For instance, a large kangaroo was well delineated, and a bird of the eagle species—perhaps an eagle-hawk—neither of which had been seen by us.

The drawing is performed by scratching the face of the rock with some sharp instrument, probably a splintered shell, bone rubbed to a point, or a piece of chipped flint, thus removing the discoloured face of the rock, and showing in strong contrast the lighter shade beneath. A

great deal of time must be devoted to this amusement, for the number of delineations seen during this short journey was very great, and none of them could be of great age. The proof of this was furnished by the state of many of the drawings, which showed that the action of the weather was very destructive to them, and it is probable that they are completely obliterated by rain and lichens within a period of ten or twelve years.

Beyond the cliffs were several sand-ridges covered with spinifex and scattered thorn-bushes. The soil was poor, with here and there a strip of good land, which seemed to crop up from a deep-lying bed of vegetable mould; at least I could not otherwise account for its presence amid so much aridity. Several river-beds crossed this plain, all of them dry, but with water in the mud a few feet below the surface. These beds had reeds growing thickly right across them, intermingled with a few tea-trees and bushes. So it is reasonable to suppose that there is never water enough in them to drown this vegetation. I call them river-beds, but they were mere brooks at best.

On the 12th we crossed a plain which was covered with "everlasting flowers," some white, some yellow; and on the 13th we came upon a herd of twenty wild cattle, the descendants of escaped animals. One of the bulls made a determined charge upon us, and paid the penalty of his rashness. A plump-looking cow was also shot; so we fared sumptuously that evening.

The next day two stock-riders were met. They were looking for stray cattle, and had a black tracker with them. From them we learned that we were forty or fifty miles further north than we had imagined, and we therefore turned more to the south-west. They reported Port Grey to be a hundred and twenty miles off—nearly twice the distance we had supposed it to be. They gave us directions for finding the nearest outlying station; and that we reached the same night, receiving a warm welcome. But it was a small hut, with but a man, his wife, and two sons for sole occupants; and I felt that our presence would be a burden to them; so after a night's rest we proceeded

westward, and late on the evening of the 15th reached the station of Mr Scott, a gentleman who insisted on our remaining with him until we were all thoroughly refreshed; and there is no doubt that, although we had not met with hair-breadth escapes, imminent perils, or suffered the extremes of hunger and thirst, we were considerably worn with constant exertion and sleeping on the ground.

At Port Grey, Packington, and other places on the west coast, I stayed for the remainder of the year 1890, visiting several distant spots, and taking two or three trips along the coast in a fishing-boat hired for the purpose. These rambles I cannot stay to narrate here. The information concerning the animals and plants of the region is embodied in the next chapter.

The country round about Port Grey, now parcelled out among the settlers, is of a similar character to that described after crossing the sand-ridges near the great marsh. Behind the township of Geraldion there is a ridge or range of flat-topped hills with two prominent peaks, which are not, however, of any great height. Mount Fairfax, four miles from the sea, is about six hundred feet high; while Wizard Peak, seven miles to the south-east, is seven hundred feet. Both are of ironstone formation, and between them there are three or four water-courses which are wet only in rainy weather. The "river" Greenough is one of these water-courses, emptying itself, if it ever does empty itself, into the sea at Port Grey. It is a series of brackish water-holes at the bottom of limestone banks thirty feet high. The last mile is a salt-water creek, and in several places in the bed trees and grass were growing at the time of my visit. I must add, however, that the plains about the Greenough bear the character among agriculturists of being the most fertile land on the middle portion of the West Australian coast; and the richness of cultivated vegetation here bears witness to the correctness of their judgment.

Along the shore to the south from Port Grey there are hills of ironstone and sandy ridges of one hundred to two hundred feet high as far as I have been along that

portion of the coast. Northward sand-ridges run parallel with the coast-line and close to it; and these, and the whole country where it has not been cleared by the colonists, are covered with scattered clumps of scrub and trees. Well away from the clearings there are scattered trees and small groves or clumps of banksias, eucalyptus, and grass-trees; and there are a few patches of the white and yellow everlasting flowers that are one of the characteristic features of this country. Other vegetable productions that may be noticed are tea-trees, wattle-grass, and cabbage-trees.

As far as I rode northward this was the character of the country. Four or five miles behind Mount Fairfax there is a range (the Victoria of Grey) of hills of about eight hundred feet above sea-level. These are also of ironstone formation, and have similar features to those of Moresby's flat-topped range near the coast.

This description of the country around Port Grey will give a good idea of the whole region for many miles on all sides of it. The trees and vegetation generally has a stunted and withered appearance; but after rain this grass and herbage improves, and looks green and vigorous. There is scarcely a fine native tree in the whole district; but imported fruit-trees, and others that are cultivated and cared for in gardens, flourish and yield well.

There are but few land animals in the district, and those few daily grow fewer before the guns of the settlers; but there are plenty of birds; and the seas all along the west coast swarm with fish. Some of these animals I now proceed to describe.

CHAPTER XVII

NOTES ON THE FAUNA OF WESTERN AUSTRALIA

FOR the purpose of fixing the localities of the animals described in these notes, I have divided the rambling journey described in the last chapters into divisions. The ground passed over during the first part of the journey I term the Swan River district, although it extends inland fully three hundred miles, and may cover an area that extends to the square of that distance. The second part of the journey is denominated the Champion Bay district, and is of similar extent. I do not say that there is a marked difference in the fauna of these two contiguous districts; but the division is a convenient one, and its usefulness will, I think, be obvious.

It is clear that I cannot, within the compass of one volume, give the details of all my rambles on the great island continent which is my native land; therefore I include in this chapter descriptions of animals extending to a much wider range than the two districts named, and I have clearly indicated the locality and circumstances under which each specimen was found or obtained. I should have liked to detail many other rambles on this western side of the continent, but as I cannot describe all, it seems to be best to select those which will probably be most interesting to the naturalist, and concentrate the results of others into as small a space as possible.

The indigenous beasts of prey in Australia are few in species and also in individual numbers, and are all of small size; but so far as I am able to judge, they are, in three cases at least, the fiercest and most bloodthirsty of all

carnivorous animals. The thylacine and the Tasmanian devil far exceed in greed of prey and ferocity of disposition anything I have read of the lion and the tiger; but not being strictly continental animals, though both were formerly abundant on the mainland, they cannot be described here. The wild dog of Australia, the dingo, however, is another matter, and to write an account of Australia and not describe the dingo, would be like eschewing mention of the lion in a work on Africa. Yet the dingo is thoroughly well known to naturalists, and even to persons who do not claim to have a scientific knowledge of the world's fauna. Therefore I will not give a complete history of the animal, but simply describe it from the point of my personal experience of it.

The first actual mention of the Australian dog is by Dampier, who saw a native accompanied by one when he visited the western side of the continent. Thus we have evidence that the animal was seen by one of the earliest navigators of Australian seas. I have found the bones of dingoes under sixty feet of alluvial deposit, and those of the same or a closely allied species in early tertiary strata. The dingo is, therefore, an old established inhabitant of the continent; but I do not think that it is indigenous. The dingo (*Canis dingo*), the Malay dog (*Canis rutilans*), and the Indian dog (*C. deccanensis*) are, in the view of many naturalists, myself included, mere varieties of a single species. They all agree, generally, in size, habits, and coloration. The dingo varies more perhaps in colour than the other two; but the usual, and therefore the natural, colour of all three is a dingy red, with a shade of yellow on the hair of the flanks. The dingo is often of a dingy yellowish colour, and there are nearly always black points, as on the face, legs, etc., about the animal, and many black hairs are scattered about the coat, particularly on the back. The tip of the tail is usually white. Black specimens of the dingo are sometimes met with, but this is purely accidental.

The dingo rarely exceeds thirty-two inches in length from the nose to the root of the tail, which is fourteen or

fifteen inches long. It is a well made and shapely animal, with strong legs and ears of moderate size. The number of young at a birth is usually three or four, occasionally five. The assertion that it has seven or eight is not confirmed by my experience. I have a record of twenty-five litters of dingo bitches by domestic fathers, mostly pointers, stag-hounds, and retrievers. Fifteen of these were of three pups each, seven of four, and three of five. The dingo will cross-breed with any kind of dog that can pair with it, and the pups sometimes most resemble the mother; occasionally have a much stronger likeness to the father. When they are most mixed they would probably be guessed to be the offspring of a Scotch collie and a retriever.

In disposition the dingo is a quarrelsome, sly, and treacherous animal. It has an excellent memory, and never forgets an act of ill-treatment on the part of either its master or any other person. It is now never kept by the colonists, who thoroughly abhor it on account of its wolf-like destructiveness; and its numbers have been greatly thinned, even within my recollection. It is a match for most dogs of double its own size, and its ferocity and strength are very great; yet it is an exceedingly cowardly animal. When caught in traps or pit-falls it often simulates death—a habit which I also find recorded of the wolf. It will then permit itself to be handled and held head downwards; but the moment it gets its chance, with a snap and a snarl it inflicts a bite on his captor which he never forgets, and in an instant is gone.

The dingo is never thoroughly tamed. Old ones captured and taken home escape on the first opportunity, and cubs reared by hand also frequently forsake their owners when they are grown. They always do so if beaten, and sometimes if merely scolded. The blackfellow almost idolises his dingo, and pets and fondles it in a ridiculous manner; but the animal, besides following him and him only, never evinces the least affection for him. No member of its master's family dare touch it; and it takes notice of none except perhaps to revenge some injury

by a sly and savage bite. This habit of unexpectedly biting persons it dislikes is very common, and is ineradicable. It is one reason why the colonists have given up the practice of keeping a dingo or two about the stations. I remember, in my youthful days, that many persons were anxious to breed crosses between dingoes and domestic dogs, under the impression that the excellent noses, speed, and powers of endurance of the former, and especially their silence when following a trail, would be of great value in a breed crossed with animals of approved strain. But that theory has long since been abandoned as a failure, experience proving that it was the bad, not the good, qualities which were most prominent in the offspring.

Sheep-worrying is one of the most troublesome habits of the dingo. Like the wolf, they destroy many more than they require for eating. If a couple of them get amongst a flock in a paddock, the squatter is fortunate if he does not lose more than a score of his best sheep. It is always the best of his flock that are first attacked; and the heaviest and strongest ram is as easily pulled down by a dingo as a rabbit is nipped by a terrier. One dingo has been known, within the space of a few hours, to destroy several score of sheep, killing some outright, and mangling others so badly that they had in mercy to be made away with.

The only wild animal in Australia that is a match for the dingo is the "old man" kangaroo, and perhaps the large light-coloured kangaroo (*Macropus unguifer*) of the west, and these he rarely ventures to attack. In attacking the larger wallabies, at least three or four dingoes combine together, and then the victim has but a poor chance of escape. I have seldom seen as many as a dozen dingoes hunting in a pack. I have read of packs exceeding one or two hundred in number, but have never seen such a thing. But dingoes are not now as numerous as they formerly were. The Colonial Governments, and even private individuals, have from time to time offered rewards for their destruction, and thousands have been shot, trapped,

and poisoned, with the result that they have become scarce animals in many districts, and are not numerous anywhere. The dingo was not abundant in any part of the west, not even in the unsettled parts of the north-west, at the time of my visit in 1889-90; nor do I believe that it ever was as numerous as some writers have reported. I base this opinion on the accounts of the blacks, who are the most likely to be correctly informed, and on the fact that a single dog, or at most two or three, was all I ever saw in the possession of one party of the natives. The animal is so valuable to them that I am sure they would have more were it easily procurable.

At a distance from settlements where there are no sheep or poultry to steal, the dingo lives on such wild animals as it captures. Birds always form the bulk of its prey, and its adeptness at catching these is extraordinary, quite equalling that of a cat. It rushes on them as they perch on low bushes or hop along the ground, and not infrequently snaps them as they fly past. Such ground-haunting species as quails and megapodes suffer a good deal from the dingo's depredations, for it is the animal's habit to destroy as many as it can before beginning to eat; and when the female has a litter of pups, she brings them much more than they can eat. She continues to hunt for her young until they are quite three parts grown.

No Australian animal can escape from the dingo by speed, and such as take refuge in holes it will dig out with extraordinary pertinacity, working for hours if necessary, with its powerful paws. It also digs burrows for its own habitation, but these are never very deep, and it prefers shallow caverns, holes among loose rocks, and hollow trees for dwelling- and breeding-places.

The dingo never barks, but howls like a wolf, and also snaps like other angry dogs, and snarls. They are said to learn to bark when associated with domestic dogs, but their bark is never very perfect. If they learn to bark like other dogs, it is a proof that they are not pure-blooded. Many of those which roam at large and are considered to be wild specimens are the part progeny of domestic dogs

which have associated with dingoes — hence, in some degree, the variation in the colour of these animals. I have had abundant proof that dingoes entice away domestic dogs at certain seasons, just as "brumbies" (wild horses) entice mares from the stations, and though these dogs almost invariably return to their homes, they leave their mark on their progeny. The howl of the dingo is one of the most lugubrious noises heard in the wilds of Australia. It is seldom uttered during the day-time, but at night, and especially on moonlight nights, it may be heard in the distance for the greater part of the hours when the lone wanderer is most anxious for rest. If they come near the camp, a shot fired at them will send them scampering away; but if they are a few hundred yards off (quite close enough for five or six of them to be an intolerable nuisance), they take no notice of the sound. I do not know what induces them to set up this howl, but as in districts which they haunt there were generally several near the camp soon after darkness set in, I thought perhaps the smell of food attracted them.

Dingoes are incorrigible thieves. In the days when they were kept as pets about the stations it was never safe to leave them unwatched. They would do immense mischief to any articles they could destroy, such as curtains and household linen, books and papers, and everything that was tearable; and perhaps the owner would see his pet meekly blinking on some soft mat or skin, stretched in the graceful attitude of rest as if it had been calmly sleeping for the past hour, to find, when he passed on to the side of the house, some dozen or more of his choice breeds of fowls and ducks with their heads nipped off. It is small wonder that the dingo has ceased to be a favourite throughout Australia.

The dingo is an exceedingly lithe and active animal. It can spring upwards at least four feet from the spot on which it stands. It can run with great speed, and its habitual movements are all performed with a sly, slinking gait, and without the least noise. Those that are in captivity or are half-tamed like to be nursed and carried, and it is

quite a common sight to see a native with his dingo in his arms, caressing it and talking to it as a mother might to a young child—to all which kindness the animal is quite oblivious.

The animal is spread over the entire continent of Australia, the islands excepted, on none of which it is found unless introduced by human agency. It has been practically exterminated in the thickly settled parts of the country and in some localities where its many depredations have provoked determined reprisals.

There are at least seven species of snakes in the Swan River and Champion Bay districts, of which, unfortunately, I can specifically name but two or three, as no specimens were brought away. Several of these are exceedingly poisonous, particularly the black-snake and the whip-snake, which are well known to all Australians; but accidents to men and cattle do not seem to be frequent, and there is no such disastrous loss of life from the bites of these venomous creatures as we hear annually occur in India. I have rarely heard of the death of a native from snake-bite, and still more rarely of that of a white man from the like cause.

Two of these snakes are species of python, one of them seeming to be a variety of diamond-snake (*Python spilotis*), but dark coloured and much marked, like the kind still called the carpet-snake by the colonists of the other side of the continent. It is called Biggemoodo by the blacks, the g's having a soft sound. Waggil is the native name for a snake; but I am not sure whether this is a general or a specific name. I collected the names of several, but cannot remember the particular snakes to which some of them are applied. The blacks eat them all, and they have no fear of any of them, though the diamond-snake is five feet long, very active, and disposed to be aggressive when disturbed. The usual method of capture is to set fire to a patch of bush, and slay the affrighted snakes and other animals as they wriggle forth from the approaching smoke and fire. Sometimes, maddened by fright and pain, the venomous snakes leap quickly from the ground and attack

the hunters, who are killing every living thing that rushes from the advancing flames; but trusting to that sureness of eye, which is an additional sense to the savage, the threatened man beats down the infuriated reptile, and in an instant it is faintly wriggling on the ground, its backbone broken, and it is seized and finished off by the women or children. All wild creatures are much frightened and bewildered by the approach of fire, and fall an easy prey to the blacks. After a "burning off" there is usually a great feast in the savage encampment.

To what has been already said about the lizards of this part of the continent I have but to add a description of a very curious species of this class of animal which I saw on visiting the Abrolhos Islands, a group of small isles lying some forty miles westward of Champion Bay.

There is nothing very remarkable in the general features of these islands, which are all small, but they stand on a coral reef, and the sight of the branched and curiously shaped masses of coral, which is visible in the perfectly clear water to a great depth (twenty fathoms at least), is remarkably beautiful. Thousands of fish dart, glide leisurely, or bask quietly, in the submarine forest, of which the chief are sea-bream of the genus *Sparidæ*, the "whiting," "herring," and "cobblers" of the fisherman, which I cannot identify, and common snapper, or schanpper, as I believe it should be called. The last named fish is found in immense shoals, and takes a bait so freely that a small boat may be filled with them in a few hours, and they form a lucrative object of pursuit to the fishermen of this coast.

Here also lurks that pirate of the deep, the shark, which is invariably accompanied by a brace of pilot-fish. Why always two? It is a curious question, and puzzling. Conversing with an ichthyologist on this point, I was surprised to hear him cast some doubt on the fact. His view, not gleaned from personal observation by the by, was that there is oftener one than two pilots with the shark, and sometimes a number. My experience extends to the coasts of Australia only, and though the shark is

sometimes seen unattended by pilots, when those fish accompany it, the number is always two; and this fact is so well known that the native draughtsmen invariably depict this number in their representations of the shark—an object they are very fond of graving on the rocks of the coasts.

While off one the islands, noted on the chart as Rat Island, one of these monsters glided slowly under the boat. The appearance of all fish in the depths of the sea is deceptive to the eye; but the size of this shark was remarked by all the fishermen as being enormous. It was accompanied by the usual pair of pilots, one swimming close to the snout, the other near the right side.

Neither book nor naturalist that I have yet met with has given a satisfactory explanation of the object of the attendance of these pilots on the shark, and I have none to offer. On this west coast of Australia I never saw a shark without its attendant scouts—if scouts they are. They *seem* to guide, or warn, the shark in some way, but I could never discover proof that they really do so. The pilots are sometimes seen without the shark, but the latter is probably lurking near at hand on such occasions. At any rate the pilots never go in shoals, large or small, in Australian waters. Four or five is the greatest number that I have ever seen together; but when a large number of sharks are assembled in one spot, each seems to be accompanied by its pair of attendants. This refers to the common blue and white sharks only, the basking-shark and the smaller sharks never having pilot-fish with them. That some mutual benefit follows the association of creatures so incongruous in general habits and organisation is certain, otherwise the pilot-fish would not be safe in the company of the shark, for the latter often snaps at very small prey. I have actually seen them seizing smaller fish than the pilot, and one which I saw captured had more than a hundred small fish in its stomach, not one of which exceeded five inches in length.

Regarding the species of sharks in this sea, I am pretty sure that there are many accidental visitors in addition to

our common species; and I also think that there are monstrous fish of this genus in the southern seas of the existence of which the compilers of works on natural history are not informed. The monster referred to above as passing under the boat I was in, looked like some huge torpedo gliding through the water. It could not have been less than thirty feet long, and may have been more than a dozen feet longer. And this fish was by no means the largest I have seen near our coasts. The huge teeth which are sometimes dredged from the bottom of the ocean and are supposed to have belonged to species now extinct, are quite possibly the remains of individuals of genera still existing. Most South-sea whalers can tell of creatures of such size and strength that it is not much to be wondered at that landsmen are suspicious of exaggeration when they hear their stories. I, however, have seen sufficient to make me willing to accept the tales of the intelligent men of those ships, with whom I have often conversed, and whose manly and straightforward narratives were evidence in themselves of their truth. There are monsters in the deep so formidable in size and fierceness of disposition that it is doubtful if they could be captured with the appliances carried by an ordinary whaler; most certainly if they could, the return would be inadequate to the danger and loss sustained in the exploit. For instance, one captain told me how he was persuaded by his crew to try the experiment on what seems to have been a huge basking-shark of fifty feet in length. After a two-hours' fight, in which the men were several times in extreme jeopardy, the immense creature got away, having done nearly a hundred pounds' worth of damage to tackle and boats.

This is a digression. I was about to mention a curious spiny-tailed lizard which was found on all the islands of the Abrolhos group I landed on, except one or two of the very smallest. It was very abundant on Rat Island, and also on a nameless islet that was not a hundred acres in extent. This singular lizard is very active, living in holes which it burrows under pieces of loose coral. The tail is

covered with spines; and the creature seems to be confined to those small islands, notwithstanding the short distance of the group from the mainland, for I could not find or hear of such a lizard on any part of the coast I visited. The animal's habits seem to be similar to those of other small lizards, nothing remarkable about them being noted. Some were seen to capture spiders (a species of *Lycosa*) and another ate a beetle, but some which I took to the mainland ate nothing for several weeks, and then readily took some moist sugar and crumbs of bread, as well as flies, which I caught for them. One or two lived for a long time, only requiring food about once in six weeks. They shed their skins twice a year, in March or April, and again about November; and it was during this evidently trying function that most of them died.

Rat Island was obviously named from the rodent, which swarms there. It is absolutely over-run with these vermin, which prey largely, if not entirely, on the molluscs and crustacians which they find on the sea-shore. They have the singular habit of swimming about in the quiet lagoons which are found here, and in the pools among the coral-rocks.

There are some strange phenomena on some of these islands. For instance, on one of the most northern, called on the chart Middle Island, a spot of land which does not seem to exceed half a mile in length by a quarter in breadth, there is a tiny water-hole in which the water ebbs and flows with the tide outside the reef, and yet it is perfectly sweet, and the best water I had tasted during the whole of my stay on the West Coast. As if to make this circumstance the more remarkable the water obtained by digging on Middle Island, or on any of the others which form the group, is either quite salt, or very brackish.

Although the islands are of coral formation, their bases seem to be a kind of limestone of a light buff colour. Most of them have low cliffs, only six or seven feet high, on the coast-line; but some are very low, and covered with mangrove forests. From the highest points on several of them the mainland is plainly visible, the atmos-

phere being delightfully bright and clear. There are bushes and herbage on nearly all of them, and there used to be wallaby on some of the largest, and seals in the lagoons; but these are nearly, or quite exterminated, and I saw none in 1889 at the time of my visit.

The islands have been the scenes of many wrecks; and it is said that some castaway Dutchman lived on Middle Island for several months some hundred and fifty years ago. Fishermen and others now use the islands a good deal; and a class of poor persons come hither in boats in search of wreckage, of which considerable quantities are often washed in from the westward. Whence this wreckage comes it is difficult to say; but I have seen some which appeared to have floated all the way from India, and to have been in the water months, and perhaps years. Most of the islands on which I landed showed signs of many visitors having been there previously. On one was a large quantity of broken glass, which seemed to have been there a very long time.

In many places the bottom of the sea is plainly discernible through the clear water, revealing the base of the barrier reef, both inside and outside the lagoon. The bottom is a lightish grey sandy mud; and the beautiful formation of the coral cannot fail to rivet the observer's attention. The base of the reef is composed of tree-like branched masses; and above the coral assumes the shape of huge fans of striated pattern, some of the masses being twenty, and occasionally perhaps thirty feet wide. The fans overlap each other in a rather curious way, with deep interstices between in which many singular creatures find a lurking place, among them a huge crab, with a stretch of claw-like leg of at least six feet. One of these crabs, which I captured, weighed more than twenty pounds. Of course these very large ones are the finest specimens. They were of many different sizes, and appeared to be of the *Oxyrhyncha* genus or family. There were also other crabs, smaller and brighter coloured, violet and red, and one a bright yellow.

Sea-birds are abundant on these islands; insomuch

that large quantities of guano have been taken from them; and this seems to have much disturbed the terns and other birds which are said to have bred here formerly. The entire soil of some of the islands has been removed. Where we found it remaining it consisted of a mixture of limestone, sand and disintegrated coral, with guano; and the rank herbage was sufficient proof of its great richness. On one small island, forty or fifty acres in extent, this soil had not been disturbed, and it was full of holes made by the "mutton-birds," as the whalers call them, or common sooty-petrel (*Ossifraga gigantea*), a bird which formerly bred in large numbers in these islands, probably because they were seldom visited previously to the establishment of the Swan River Colony. This circumstance, and the fact that this group is the southernmost point in Australia, and I believe in the world, where coral is found, is alone sufficient to make the Abrolhos a remarkable group in the eyes of a naturalist.

The natives of Australia not using sea-going canoes probably never visited these islands, as they could scarcely venture so far from the mainland on the rafts they sometimes use. I could find no traces of them on any of them except on a small islet ninety yards long by forty to fifty wide, where I picked up a native spear and wommera, or throwing-stick. Those, no doubt, had been brought thither by some blackfellow in the company of whites, the natives sometimes being employed by the fishermen and wreckers, on account of their skill as divers. For though the blacks are no navigators, not having advanced in the art of ship-building beyond the raft-making stage, they are nearly equal to the South-sea islanders in skill as divers and surf-swimmers; and I have known them swim off to islands that are four or five miles from the mainland. They have no fear of sharks, which they can dodge with perfect ease, and indeed they often actually chase fish in the water, driving them into shallows, where they can spear them with the greatest ease.

The island on which this spear was found was composed of huge pieces of the fan-shaped coral mentioned

just now. These pieces which were dead lay flat, and a few weeds had already established themselves among the débris. As illustrating how the fauna of isolated islands begins to obtain a footing, it may be interesting to record that three species of small beetles—a lycosa, another spider of minute size, and some gnats—comprised, as far as I could see, the total permanent population of the islet. These, or their larvæ, had probably been brought to this small spot of land in the plumage of birds which had chanced to alight there.

To return to the mainland.

All the rivers, marshes, and water-holes of the western colony are more or less haunted by tortoises, the commonest kind in the Champion Bay district and the country to the northward being a small *Chelodina*, or long-necked tortoise. These Chelodinas—of which there seems to be two species near Champion Bay, one of which is *C. oblonga*—are very commonly turned up when one is digging wells in the beds of the rivers, and they are almost sure to be found in the wet water-holes, where they are sought for by the blacks as an esteemed article of food.

The fish found in the fresh waters of the same districts are very insignificant in point of size, though some of them are very numerous. I am not a very enthusiastic disciple of Izaak Walton, and have not devoted much time to what I think I have heard termed the "gentle art"; and therefore when I record that one of the largest fishes I caught in a western river did not exceed ten or eleven inches in length, I do not mean to say that Westralian waters do not contain any bigger specimens. If they do contain larger fish, considerable patience will have to be expended in the task of finding them.

The fish in question seemed to be a kind of bream of rather singular appearance about the head, it having a peculiar ridge, in which the nostrils were situated. A much smaller fish from the same waters was notable on account of its singular marking. It was of a dark olive green colour on the back, gradually becoming lighter to white on the belly, and on each side were three prominent

black spots. A maggot is the best bait for these fish, and if they are in the humour to bite, fifty or sixty may be captured in the course of an afternoon's sport.

Insects are numerous and curious in the Champion Bay and Swan River districts, but the only invertebrate animal I can find space to mention is a very singular springing centipede of considerable length—generally thirteen or fourteen inches; but one very fine specimen I captured was nearly seventeen inches long. This centipede is of a coppery hue, with greenish reflections, and frequents plains on which the herbage is short and scanty. When disturbed, and wishing to ensure its escape from danger, it draws the tail end of its body up to the head, forming a loop in the manner of some caterpillers when progressing along a twig. Then the centipede suddenly springs a distance of twelve or sixteen feet, and repeats the movement, generally disappearing in two or three springs.

This centipede seems to be unknown to science. Some which I sent to a friend were lost while passing through the post, and unfortunately I did not hear of this until it was too late to obtain others. It does not seem to be very abundant nor very widely spread, many of the colonists never having seen it, and most of those who had expressing great fear and abhorrence of it; and it must be confessed that a centipede considerably exceeding a foot in length is a rather formidable-looking creature. If this animal is a true centipede, and I have some doubt about it, I think it will prove to be the largest of its genus, while its peculiar habit renders it one of the most noticeable. In vain have I searched books for a reference to this arachnida, and visited museums in search of a preserved specimen, and the only gentleman of education and literary culture whom I could find acquainted with it was Mr Davenport Cleland, who is an authority on Australian subjects, but scarcely, I think, a finished naturalist. He, like the farmers of the Champion Bay district, seems to have had too great a dislike to the creature to examine it very closely. This centipede was

seen in greater (but not numerous) numbers on the Kolaina Plains north of the Gascoyne River, Shark Bay district.

Of the vegetation of the region I have already said something, and now offer a few more brief remarks. In the Champion and Swan River districts trees are not abundant near the coast. In places, or locally, there are more in the interior of the country, though many have been destroyed. All have popular colonial names, and most of them native names, which I collected. There are about fourteen species of eucalyptus, some of which are unknown or at least very scarce at Swan River. Of these the blue-gum, red-gum, white-gum, and "mahogany" [*sic*] are the commonest, and the native names in order are: co-lort', car-dau', wandow, and ghar-rah-el. There is one palm (*Zamia media*—native, gherge), the nut of which, called bay-i-o by the blacks, is much sought after by them, as they are very fond of it. This tree is much more abundant in the back country of the Shark Bay district. I do not remember to have seen it south of Swan River, where it is not abundant even in the interior, a hundred miles beyond the outlying settlements.

The "black-boy" grass-tree (*Zanthahast*), bal-ga of the natives, I have already described. It flourishes as far north as I have been—that is a good hundred miles beyond the Gascoyne River. The "honeysuckle" of the colonists, mang-joy-te of the natives, a Banksia, flourishes in a wild state throughout the west and in other parts, and is largely cultivated about the stations and houses of the wealthy colonists, who justly esteem it for its delightful odour and appearance. The "beef-tree" is the solitary species of casuarina I saw here, and the "raspberry-jam" and the "black-wattle" are acacias.

Other noteworthy plants in this district are the native apples (kwe-ou-ni), potato (tu-buc), turnip (kan-no), and yam (wer-rang), generally called the warren-root. Of these the potato is an Orchis; the natural orders of the others I cannot tell. These, some other roots and fruits, and nuts, form a large part of the ordinary diet of the

natives. There are several species of nuts which are common in all the western districts I have mentioned from King George's Sound northward, of which I have learned the native names of two kinds only—the bi-u or bay-i-o and the mad-dah. The latter is obtained from the zamia palm, and if it is eaten before it is perfectly ripe and has been well dried, it is very apt to produce the symptoms of incipient poisoning.

The "swamp-oak," called by the natives the yi-em-bak, is a most useful shrub to them. The bark is thin and paper-like, and is used for a great variety of purposes, particularly to make water-bags and vessels of, to make waist-cloths, and to cover their huts when they are at the trouble to construct the latter.

Among the smaller plants the dandelion is so widely distributed that I think it must be indigenous; but I could gather no certain information on this point. The flowers are often very large, and the plant grows in great masses in some of the retired spots north of Champion Bay. Near the settlements it is kept down by the farmers, with whom it is no favourite. There is also a species of mallow that is certainly indigenous; and the New Zealand flax (*Phormium tenax*) is very abundant everywhere in the west; north of the Gascoyne large patches of the desert in the interior are covered with it.

I now conclude the chapter with some account of the birds of the west coast—one of its most important features, from the naturalist's point of view. Near the sea, and for a considerable distance from the mouths of the larger streams, when they have water in them, are many gulls. All those mentioned as having been seen in the Great Bight are found on the coasts of Westralia, and in addition the great sooty-petrel is found on some of the small islands. Formerly the Abrolhos swarmed with them. A few are still there, and they are found, as wanderers, on many different parts of the coast; but I do not think they breed elsewhere than on the Abrolhos on this side of the continent.

Pelicans are also found on these coasts, and they

breed in large numbers on the rocks about Exmouth Gulf, and on some of the islands of Dampier's archipelago, especially those that are surrounded with a fringe of mangroves. Flocks of them may be seen on the north coast which number the birds by tens of thousands; but they are not so abundant near the colonies, though I have seen a large flock hovering over the upper reaches of the Swan.

A species of gannet (*Sula piscatrix*) must also be mentioned; for though I do not know that it is common on the west coast, two were shot by me near Port Grey. They were remarkable for their red legs and feet.

The cockatoos and parrots are the most characteristic birds of the district. They are most abundant in the interior, especially where the trees form woods and groves. There are at least eight species or varieties of cockatoos in the country between Swan River and Shark Bay. The commonest is the sulphur-crested (*Cacatua galerita*), which, in some parts of the country, especially where the rivers are edged with mangrove thickets, may be seen in flocks so great that the trees look as if covered with masses of white wool. If these huge flocks, which on the Gascoyne sometimes number thirty or forty thousand birds, are fired at, the screaming they set up is deafening. There are two varieties of the black cockatoo—*Calyptorhynchus xanthonotus* with a yellow-banded tail, and a variety with a red-banded tail, the plumage in both being of a bright sheeny black. These birds are not nearly so abundant as the white kind, and do not go in large flocks. It is rare to see more than twenty or thirty together; but occasionally they assemble in flocks of a few hundreds, I think for the purpose of migration. Both kinds of these cockatoos, called slender-bills (*Lichmetis nasica* and *L. pertinator*), are found in the Swan River district in considerable numbers, and are still more abundant in the Champion Bay locality and further north. The beautiful pink *C. leadbeateri* is occasionally seen in the inland parts of the Swan River district, and has been shot near Perth, while the still handsomer *C.*

roseicapilla, with brilliant rose-coloured breast and grey back and wings is abundant enough, especially about Champion Bay, and Gascoyne River.

A kind of crested paroquet, the cockatiel (*Callopsittacus novæ hollandiæ*), with plumage of grey and yellow and white markings on the head and wings, is found in many localities, and is a great favourite with the colonists on account of its gentle ways and pleasing tricks; and this parrot and the rose-breasted cockatoo are two of the kinds most frequently kept in their houses as pets. The cockatiel frequently manifests great affection for its master; and has been known to pine to death when the hand which used to feed it has been suddenly removed by death.

The most gorgeous plumaged of the parrots in the Champion Bay region is the Rosella paroquet, which seems to me to be a mere variety of the Rose Hill parrot of Gippsland (*Platycoreus eximius*), a bird which, I am told by some brother naturalists, is confined to South Australia and Tasmania; but as they have not seen the Champion Bay variety, I think they may be wrong, and that the bird has a greater range than is supposed. At any rate, there is no more difference between the two birds than is common in widely scattered varieties of a species.

In its habits the Rosella greatly resembles the grass paroquets, and is quite as often seen on the ground as on trees, and is not infrequently seen perched on the back of cattle, where it evidently searches for the parasites which infest the hides of the animals. For this parrot is nearly omnivorous, and will eat animal food as freely as it does grain. The farmers say it does much mischief to their corn-crops; but I have proved conclusively that it is not grain only that attracts it to ground that is under cultivation. It preys largely on the larvæ of insects of the grasshopper kind, which also prefer to haunt cultivated ground, probably on account of its looseness. The farmers are therefore in error in destroying this bird, which they do without mercy. Many are caught in traps baited with

meat, which they seek eagerly, and in confinement will take in preference to any other kind of food. The bird goes in flocks of considerable size in districts where it has not been persecuted. I have seen perhaps four or five hundred together; but when feeding, the flocks scatter very much, as all the ground-feeding Australian parrots do.

Among birds which it may interest naturalists to know were found in the districts between King George's Sound and the Gascoyne River, but which can only be incidentally noticed, was a species of *Meliphagus*, not specifically determined, which was remarkable for feeding on beetles and other insects, as well as on the food to which its genus is supposed to be confined.

On a point of land near the entrance to Shark Bay, I saw a small flock of painted snipe (*Rhynchus australis*), three of which I shot. This bird has been obtained near Fremantle and at other places northward along the coast; but it is not abundant in those localities. On the Gascoyne I found a nest of this species, with four young ones in it; but though I watched long and carefully, I did not get a sight of the old birds, and in the settled colonies I could obtain no information about this snipe, which seems to be almost unknown to the colonists.

Curlews, plovers, and allied genera of many different species, are numerous along the entire coast of Australia, some being accidental visitors seldom seen, others migrants, and a few rovers which are well known in widely removed parts of the earth, the glossy ibis (*Falcinellus igneus*), for example, which is not a rare bird in the Champion Bay district.

Plovers are very numerous, although they seldom or never assemble in such immense flocks as their European allies seem to do. They are generally found in small flights of forty to seventy birds; sometimes a few hundreds are seen together. On the other side of the continent, in some of the great marshes, I have seen much larger flocks of the same species that are common here; but yet I think that European plovers are more gregarious than Australian.

One of the most notable of the plovers on the west coast is *Himantopius leucocephalus*, remarkable for the length of its slender legs and its equally slender bill. It is generally seen in flocks of about twenty birds, which frequent the sea-shore and the banks of rivers nearly throughout their entire courses. This bird is very wild and difficult to shoot, even in spots that are perhaps never—certainly very rarely—visited by the colonists or other persons using guns.

There are at least two species of oyster-catchers: one, called by the colonists the red-bill, has a pied plumage and a bright red bill; the other bird is *Hæmatopus unicolour*. The red-bill is very common, especially in favoured localities; the other is fairly abundant, but is a somewhat local bird. There is, I believe, a third species, but as when I fired at it I missed with both barrels, I did not have an opportunity of examining the bird very closely.

There is a godwit on the coasts of both the Swan River and the Champion Bay districts; and this bird, which I cannot perceive to differ from the bar-tailed godwit (*Limosa rufa*) of Europe, is found, with another species which does not differ from the black-tailed (*L. melanura*), in the Gascoyne River locality. I have seen both these birds at various points on the south coast of Australia, but never on the east. They are nowhere numerous, and I never could learn anything of their breeding habits. I therefore conclude that they are migrants or occasional visitants.

In the country south of Swan River, and also in Shark Bay, there is a species of dotterel (*Eudromias rufiventris*) called by the colonists a plover. This bird is more plentiful in other districts, and seems to be very widely spread in Australia, for I have shot specimens near Port Darwin, in North Queensland, and in South Australia.

All the birds enumerated above are as often found on the courses of rivers as on the shores, except where the settlements are thickly established. I have rarely found any of them far from water; but on some streams, in the dry season, when only a few holes contain mud or water,

those holes will be covered with flocks of these birds, perhaps seven or eight or more species intermingled. Small fish, fresh-water mussels, and doubtless worms and minute crustacians, are the prey they seek in such spots.

The common grey plover of Europe (*Charadius helveticus*) is also the common species of the Westralian coasts, and differs in habits from its allies mentioned above in that it is often met with in the interior on dry barren plains, and especially on hills and elevated spots, where I have occasionally found its four spotted eggs laid in cup-shaped hollows lined with a little fine grass. About twenty birds is the usual number in a flock, and it is rarely that more than a hundred are seen together. Whether it is from scarcity of food, or for some other reason, I cannot tell, but this species, in common with others of the family, often break up their flocks into parties of four or five (family parties, perhaps), and seem to wander to the very sources of the streams. I have found them at water-holes three hundred miles at least from the coast; and the grey plover may be seen on some of the most desert-like of the western plains.

Besides the common quails, which are found nearly everywhere in Australia, and are too well known to require description here, there is a bird called by the Swan River settlers the painted quail (*Hæmipodius melinatus*), found on both the mainland and the small islands off the coast; and I think all along the north coast. At any rate I have seen it near Port Darwin and in Queensland. On some of the Abrolhos islands it was abundant at the time of my visit —more so than on the mainland. It is one of those birds called by modern naturalists bustard quails; but it seems to me to be more nearly allied to the coursers or plovers. Its breeding habits are quite different from those of the quails, and its eggs are very dissimiliar to those of that family—they are four in number, and thickly blotched and spotted. On the Abrolhos the birds are scattered all over the islands they inhabit; on the mainland they generally run in flocks of about sixty, and their food consists chiefly of insects, but they also eat grain, seeds, and fruit. They

are not pugnacious like the quails; and while the cocks of the latter may often be seen fighting in the breeding season, the *Hæmipodius* is a quiet and inoffensive bird, pairing with one partner, and seemingly remaining true to her for life—a very different habit to that of the common quail.

There are, of course, many small birds in this region, but it is impossible that I can mention them here. One of the most beautiful, and at the same time peculiarly coloured, is a finch or passere (*Emblama picta*), which seems to be rather rare in the Champion Bay district, the only place where I found it, though I heard that it had been seen on the Abrolhos, which, for such small islands, seem to be a favourite resort of a great many birds. The breast of the bird mentioned is black, spotted with white, longitudinally striped with bright crimson or blood colour. There are also patches of crimson about the neck, and the tail coverts are of the same bright hue. Of the habits of this bird, meeting with it only once, I learned nothing. Some of the colonists had seen such a bird on previous occasions, but thought that it was very rare near Port Grey.

On the Gascoyne, at several places, I found a very beautiful weaver-bird (*Amadina gouldiæ*), the plumage of which was richly coloured with bright green, sheeny violet, and lemon yellow. It has a pleasant little song, not consisting of many notes it is true, but soft and pleasing in tone. I found the nest of this bird, which was scarcely a typical weaver-bird's nest; but it was well made of interwoven grasses, roots, leaves, and lichen, so firmly lashed to the small twigs of the bush in which it was placed, that it could not be removed without much cutting. There were neither eggs nor young in the nest, the breeding season being over at the time of my visit to the Gascoyne.

Two birds of the duck species are all that can be mentioned in this already too long chapter. The first is the green cotton teal (*Natapus pulchellas*), a beautiful little duck that looks like a miniature goose. It is only from twelve to fourteen inches in length, with a dark-green back, wings, and tail, light underparts, and a distinct white band

across the wings, which is very prominent when the bird is flying. This teal is rare on the coast between Swan River and Shark Bay, some of the colonists never having seen it. It seems to be more abundant in the north, and I saw four flocks on the Gascoyne. It generally flies in very small parties, those I have seen varying in number from eight to thirty birds. It is wild, flys high, and is more often met with on rivers and inland marshes than near the sea-coast. I know that it is found along the shores of the Gulf of Carpentaria, and in York Peninsula, and some other parts of Queensland.

There are two or three species of goose in the Champion Bay and Swan River districts, of which the Australian brent goose is the scarcest. This bird (*Bernicla jubata*) is only as large as a hen, and, like the teal, goes in small flocks only, generally about a dozen individuals in each, or twenty at most. It is a shy bird even in districts where it cannot possibly be often disturbed; and it is remarkable that this shyness of disposition is a characteristic of so many Australian birds. It is quite contrary to what one so often reads of the birds in little frequented lands. The brent goose is found on the sea-shore as well as about the estuaries of streams and on marshes. I have never found it, however, on marshes which were further than an easy flight (some fifty or sixty miles at most) from the coast. It feeds to a great extent on small crustacians, including young crabs, crawfish, and such molluscs as are not protected by a shell too hard for it to break, though I have seen it breaking mussels by beating them on hard ground. As it eats grubs, slugs, etc., it is a useful bird to the farmers, and is often seen wandering over ploughed fields—a habit it must have learned, of course, since the settlement of the country; and it is surprising how many Australian birds have modified their habits since the occupation of the country by a civilised population. This modification of habit is less marked in the mammals, which are, I fear, in many instances doomed to extinction with the increase of cultivated areas.

Australia is invariably referred to as the land of

marsupials, and beyond controversy it is the headquarter region of that remarkable class of mammals ; but placental animals are more abundant in species in the great southern continent than seems to be generally realised, and in numbers of individuals some of the last named group far exceed any of the marsupials, the kangaroo and wallaby genera perhaps excepted. The native rats and mice, which are not marsupials, abound to such an extent in many parts of the Swan River and Champion Bay districts, that large tracts of country are completely honeycombed with their burrows. I have found spots over which it was impossible to walk, owing to the fatigue occasioned by sinking in up to the knee at every step.

Other exceedingly prolific animals of the placental type are the so-called "vampires," which, though not previously mentioned, are almost omnipresent throughout the western districts. Go where one will in this part of the country, he will hear the howling of the wild dog (not a marsupial) and be disturbed by the shrill screeching of the vampires, as the colonists persistently insist on calling them. They are really fruit-bats, and as guileless of blood-seeking as the most innocent of animals, but prejudice is rife against them, and they suffer to some extent in consequence.

Where they have not been destroyed, the number of bats is very great and the species is much varied. I am not sure that I have noted all, but there are at least a dozen or fourteen different kinds in the country between the Swan and the Gascoyne. These are not all fruit-bats, and they differ widely in appearance, colour, and habits. The commonest and largest of the fruit-bats in the Champion Bay district is the red-necked fruit-bat, which seems to be specifically different from *Pteropus poliocephalus*. This bat flies in large troops at almost all hours of the day, and the noise it makes is surprising. Notwithstanding that it is about in the daytime, flights of them roam about also far into the night, especially when the moon is shining brightly, and the noise of their screaming, which is exceedingly shrill and loud, effectually prevents the sleep of the

tired traveller. Sometimes six or seven hundred fly in one troop, but more often five or six parties wheel about the same neighbourhood, the number in each lot varying, but the aggregate amounting to several thousands. This is in spots where the colonists have not decimated them, for the fruit-growers are their inveterate enemies, and destroy them by every possible means. Poison is used against them in several ways; it is mixed with honey, and sometimes with beer, and the pots containing the mixture suspended in the trees where they congregate at night. Not many seem to be destroyed by this means, for they are so greedy for both beer and honey that comparatively few individuals taste the fatal mixture. Those that first get at the pots drive the others away, and much more of the poison is wasted than is swallowed. Shooting is another way of destroying them, a great many being killed at a shot as they hang thickly in the trees. Yet the numbers still remaining, especially in lonely spots far from the habitations of men, is enormous; so much so, that it is surprising that they find sufficient food, especially as they are very greedy animals. They eat apples and pears, as well as the softer fruits, and knock off much from the branches in their struggles and squabbles to secure the best places on the trees.

These bats are almost incessantly fighting among themselves, and one of the most common causes of disagreement seems to be the possession of certain trees for resting-places. They congregate on four or five trees, to the exclusion of others close at hand that seem to be well suited for their purpose; and I am sure that I have seen more than a thousand on one tree, though, as they hang very thickly, looking like a lot of old rags, it is impossible to count them. The trees they frequent can always be recognised by the state of the ground underneath, which is covered with the refuse of fruit and their droppings, and also with multitudes of leaves, which they tear off for no discernible purpose.

I could never discover if they make a nest, or where the young are brought forth. They seem to have but

one at a birth, which the female carries head downwards on her breast, with its legs clinging round her body. This does not appear to at all impede her flight, although the young one retains this position till it looks almost as large as its mother.

A very curious bat is the tube-nosed fruit-bat (*Harpyia australis*), which does not seem to be known in the Swan River district, is seldom seen at Champion Bay, and is not very abundant in the Gascoyne River district, though it is tolerably plentiful in North Queensland. Possibly it is more numerous in all the places mentioned than appears, but its small size and nocturnal habits prevent its being observed.

This species is rarely seen abroad in the daytime, and its habits are consequently difficult to study. It does not go in large flocks, nor hang in clusters on the trees. I have found a few hanging on trees, but always in situations where they were well concealed; and generally they are found clinging to the sides of hollow trees. In such situations I have found about twenty together. They do not usually appear until the evening shades are deepening into the darkness of night; and on the only occasion on which I discovered a tube-nosed bat feeding it was eating the pulpy matter of the fruit of the baio-tree (*Zamia media*).

The tube-nosed bat differs very markedly from all other bats with which I am acquainted, not only in the extraordinary appendages from which it is named, but also in the remarkably large size of its eyes, and the extreme backward position of the ears. The tubes are an external prolongation, to the extent of nearly half an inch, of the nostrils; and this bat probably relies for guidance during flight on the sense of smell, as some others are known to do on that of touch. I have carefully watched bats of this species during their flight, on every possible occasion, with the result that I feel sure that the strange nasal development serves a similar purpose to that of the equally remarkable "nose-leaves" of some other species is believed to do. Experiments with a captive specimen showed

these tubes to be very sensitive organs. This captive tube-nose would not eat while caged, and as I feared it would die, I soon gave it its liberty. It was most restless during the whole time I had possession of it. It uttered a cry which was quite different from that of other Australian fruit-bats, being neither loud nor harsh; indeed, this remarkable bat is altogether different in appearance and habits from the red-necked and other species.

Of the leaf-nosed bats I could discover only one in the neighbourhood of Champion Bay (*Rhinolophus megaphyllus*), which is mentioned chiefly to show its distribution. By some Australian naturalists this species is believed to be confined to York Peninsula. I, however, obtained it thirty miles inland from Port Grey, and shot another specimen a few miles to the north of that place. I have also seen it near Port Darwin. It does not, however, seem to be known in the Swan River district.

CHAPTER XVIII

THE PORT DARWIN DISTRICT

I HAVE made three separate visits to Port Darwin, the first being as long ago as 1870, when Palmerston was quite a newly-founded township, being scarcely a twelvemonth old. The vicissitudes of the northern settlements, and attempted settlements, have been very great, even considering the trying experiences of Australian settlements in general, which have almost always been such as to demand extraordinary courage and self-sacrifice on the part of the colonists; but it is beyond my province to narrate them here. As the point of contact of the great British-Australian cable and the headquarters of the equally great (from an Australian point of view, at any rate) Overland-telegraph, Port Darwin has become a place of the highest importance to the colonies; and Palmerston's future is now as firmly established and sure as that of Sydney or Adelaide. The township is a place of telegraph-men and Chinamen, the latter especially; indeed, the population might truly be termed a yellow one, for "John Chinaman," as he is locally called, is here in thousands. Half the tradesmen and all the servants are of Chinese nationality; and the industrious men of the celestial empire here perform all those offices which in an English or refined Australian home invariably fall to the lot of the lady of the house and her maids. Here the white lady was a rare exotic at the times of all my visits, the last of which, and the one referred to in this chapter, took place in 1882.

At the times I refer to, the "Northern Territory," as it

is always called by Australians, was reached by means of steamers engaged in the China trade. These, mostly starting from Adelaide, called at intermediate ports, and landed passengers and parcels at Port Darwin. The route invariably taken, so far as I know, was *viâ* the east coast and Torres Straits, and the voyage usually took about three weeks to perform.

Palmerston is situated on a marked rise of the ground, and, with its colonnaded and verandahed, chimneyless houses, has the appearance of a small Indian town; though, at the time of my knowledge of the place, the absence of lofty and imposing buildings was very conspicuous. In its neighbourhood there were several interesting mementos of the past, consisting of trees with names and dates cut by explorers and navigators who had taken part in charting the coast. Captain Owen Stanley's tree was carefully preserved, and another still bearing evidence of the *Beagle's* visit; nor may Stuart's tree be forgotten. But perhaps the most interesting, because the most pathetic, evidence of the struggles of brave men, were the many relics of the ill-fated pioneers of colonisation in this region.

As at Perth, Port Grey, etc., the country for a wide area in the neighbourhood of Palmerston bears much evidence of those alterations in contour and general appearance which are the inevitable accompaniments of civilisation. Hosts of imported plants, trees, and animals, make it difficult to study the natural productions of the country in the vicinity of the settlement.

The first noticeable difference between this and the districts of Australia I had been most used to was the heat of the climate, which seemed to be semi-tropical, and, as a consequence I presume, the vegetation was luxuriant to a degree I had seldom witnessed in other parts of the continent. Fig-trees were large, abundant, and in flourishing condition; and near the town I saw some magnificent specimens of the banyan. These, and many other species to which I was a stranger, were, I suppose, importations. Of native trees and plants I saw but few

that were new to me ; but many trees which at Swan River and Champion Bay were small, if not mere bushes, were here very fine and vigorous in appearance. Even beyond the settlements, in the milder parts of the district, trees and shrubs which further south had in the deserts a withered and half-dead appearance, were fine trees, full of life and beauty.

Yet it must not be supposed that there are no barren and sterile spots in this region. Much of the interior of the country has the usual Australian desert-like appearance ; though most certainly at least nine-tenths of the whole northern territory can be made good, fertile, produce-bearing land. The rain-fall, I think, is greater here than in any other part of the continent. It is said to be always at least over sixty, and often over seventy inches annually. To my personal knowledge, it is very great compared with other great divisions of the country.

Of course I rambled much about the district, venturing a considerable distance inland in spite of friendly cautions concerning the hostility of the blacks, who, naturally enough, strongly resent the white man's encroachments on their birthrights. The natives in the vicinity of Palmerston are amenable enough, but idle, and lead loafing, aimless lives, subsisting on the charity of the white men, which is rather lavishly bestowed on them. In the interior, however, the blacks are a fine, warlike race of men of great independence of spirit, and have often shown what in any other race would be called heroic bravery. Knowing full well the deadly effect of firearms, they have still had the courage to face the white invader in the open, and that at close quarters, though armed only with clubs and their puny spears and throwing-sticks.

At the time of my rambles, there was no loose or floating white population at Port Darwin. The farmer, or stockman, had not yet made his appearance in any appreciable numbers, and white servants were not to be had on any terms. Everything was excessively dear, including even Chinese labour. At Port Darwin, indeed, the wily celestial has found another paradise, as will be

perceived when I mention that one of these cunning money-gatherers charged me a shilling for a shave, and two more for cutting my hair. A week's washing (the climate is hot, and clean linen an essential) usually cost a sovereign, and all other things were charged for in proportion.

The Chinaman cannot be correctly termed an immigrant: he is simply a sojourner in the land in search of a competency, which he intends to enjoy in his own land. Money is his one want, and for this he sacrifices everything, including health. He is here, as elsewhere in Australia, a mean, cringing fellow, who is never properly fed, unless when he is a domestic in a colonist's house and has not to buy his food. Half-starved, dirty in habit, and facing every risk, many Chinese die of privation; yet all those who have spent a year or two in the country are passing rich. In from five to seven years they have generally saved sufficient to enable them to live an independent life in China, and thither they return with their wealth.

No white followers being procurable, I was compelled to ramble accompanied only by my personal servant, a man only twenty-two years of age, a couple of Chinese rogues who robbed me systematically, and three black-boys for horse-leaders. The horses, by the by, were the most wretched specimens of their race that I ever owned. There are no good horses at Port Darwin, and few horses of any kind. I had to make a shift with such animals as were procurable; and the lack of proper transport and reliable companions deterred me from undertaking any long or adventurous journey. I advanced just so far into the interior as to get a tolerably good idea of the nature of the country; but not so far, by several hundred miles, as I would have ventured had I been properly equipped to undertake the risk.

Generally, the country within three hundred miles of Port Darwin is a flat plain, undulating occasionally, more often very marshy, and according to my experiences, impassable. The scrub is tall and exceedingly dense, and there is plenty of wood, not massed in extensive

forests, but usually in groves of a few miles extent in length and breadth. Frequently it is impossible to force a way through these groves, and even through the scrub. It would take several days to cut a passage a mile long. The traveller must therefore take a very circuitous route to avoid these frequently recurring obstacles. Some of the marshes are exceedingly dangerous, abounding in quicksands and quagmires, in which, once embogged, the traveller would find himself fatally trapped. Escape would be impossible, so thoroughly rotten is the ground.

This country abounds with game, consisting of kangaroos, wallaby, emus, bustards, ducks, geese, and small animals and birds unnumbered. It is the best supplied district in this respect that I have ever seen in all Australia. The blacks also are numerous and dangerous. They have seldom an inclination to communicate with the white wanderers amongst them, and require no provocation to commence an attack.

The rivers and streams have short courses in this district, but many of them are deep and have water in their beds at all times. The banks are not so steep as those of the streams in the Swan River-Champion Bay district, and they are usually covered with thick beds of reeds, or a kind of grass, which is often nearly twenty feet high. There is also a goodly belt of trees along the courses of many of the rivers, and in these the largest flocks of cockatoos I have ever seen congregate, completely covering the trees for a distance of several hundred yards, and presenting a scene as extraordinary as it is beautiful. When these birds rise in a body, the noise of their screaming is deafening, and can be heard when the birds are so far off that they cannot be seen. When wheeling about in the air, with the bright sunshine reflecting on their snowy plumage, they present a truly magnificent sight.

My journey commenced on the 19th September, I having spent several days previously rambling about the country in the vicinity of Palmerston. Much of the land formerly under cultivation had been abandoned at this time; and I saw several ruined coffee plantations, with

the shrub growing wild, and still bearing berries, though of very inferior quality. Attempts seemed to have been made to grow fruit also, and there were apple-, plum-, and cherry-trees in some of the orchards. The plums were the only ones in a flourishing condition.

The dwellings, mostly timber-built one-storey bungalows, were generally in an advanced state of decay, and swarming with rats and other vermin, including snakes in some of them. Strange to relate, the two common species of European rats, the black (*M. rattus*) and the brown (*Mus decumanus*), were both seen inhabiting the same houses, the black kind seeming to be in a majority. However these rats may disagree in European countries, the larger and stronger kind has not in Australia as yet gained the mastery. I have frequently observed the two kinds on the eastern side of the continent, in many parts of which they are plentiful; and though they often keep to separate districts, I could never discover that there was an active enmity between them; while I learned from the whalers that both kinds are almost invariably occupants of their ships, where they prove a great pest.

Ships are great transporters of rats. Long-distance sailing vessels, such as whalers, which are often beached for careening purposes, seize such opportunities for getting rid of the majority of their rats. Planks are placed from the ship to the dry land, and great drumming of tin kettles, etc., is kept up below for some hours. This so terrifies the rats that many of them escape from the ship by means of the planks. In this way many districts of Australia have been peopled with vermin in a former generation, when the beaching of small wooden vessels was a common practice.

Besides the brown and the black there was also the common native species; and I also found the Queensland rat (*Xeromys myoides*), thus proving that this species is found right across the northern part of the continent.

The blacks had visited all the deserted houses I passed, breaking down the partitions and doors, which they had carried away, probably to make their wurleys, or lean-tos.

These people had also dug up the gardens in search of roots, hacked some of the trees, and made their fire places on what had formerly been lawns. There were signs that the hostile blacks often approached to within a few miles of Palmerston. The occupied outlying settlements were very few in number, and not established at any great distance from the Port.

We reached the head of the Adelaide River on the afternoon of the 19th September, and camped there in a thick grove of trees, which we penetrated to some distance in the hope of hiding our fire from any prowling blacks who might chance to be in the neighbourhood. The country is a flat plain about here, the Adelaide appearing to rise in the only elevated ground we could see—a range of low hills to the southward. The plain is well wooded, and the scrub a kind of jungle, which makes travelling dangerous, as the hostile blacks have excellent opportunities under its cover of creeping up unseen.

There being signs of the presence in the neighbourhood of a considerable tribe of the natives, we spent an anxious night. Once or twice during the night one of my blackboys and myself quitted the shelter of the wood and went on the plain to reconnoitre. We could see five or six fires burning brightly at an apparent distance of two miles; and it was the opinion of my black that our tracks had been discovered.

This was no doubt the case, for when we resumed our journey in the morning, a party of forty armed men stood near the wood and watched our movements. They did not make any threatening movement, and after following us some distance they closed in and surrounded us. They were not very friendly; still, they refrained from any active display of hostility. My blackboys seemed to be the object of their greatest dislike, at which I was surprised. I suppose, however, that patriotism may have been at the bottom of their enmity, and that their feelings were akin to those of the Highlanders for the "lowland carls who let the enemy in." These blacks accepted a few presents from my hand; and about noon the whole tribe

abruptly departed, going southward, and we saw no more of them. They were exceedingly fine men, most of them being five feet nine or ten inches in height, and well proportioned. There were no old men amongst them, the oldest not exceeding forty years.

Seven miles beyond the wood we came to a patch of most extraordinary looking country. It was covered with enormous ant-hills, many of them nearly twenty feet high. They completely shut off our view of the distant country; and we seemed to be passing through a necropolis of strange tumuli. Many bones were strewn about, the place seeming to be a favourite haunt of the wild dogs, whose monotonous howling we heard both night and day, though we never saw more than five or six of the animals at a time. These ant-hills were, many of them at least, of great age, the sides rutted and seamed deeply, and often covered with a kind of brown, yellow, and reddish lichens.

The colonists are fond of remarking that nobody has ever seen a freshly erected ant-hill, and that there is some mystery about their formation. This is simply a popular error. Ant-hills of all sizes may be found where these insects (Termites) abound. They are increased in size so gradually that their growth is not perceptible to the careless eye. By constant watching I have perceived that small hills are thrown up comparatively more quickly than they are afterwards increased in size. In the first year they may be brought up to a foot in height; at the end of seven years it is a good hill that is three feet high. After that the increase is very slow—a hill of twenty feet high is probably several hundred years old. The highest hill I have measured, near the Burdekin River, Queensland, was twenty-two feet four inches. Hills of fourteen to eighteen feet are very common, both in Queensland and in the Port Darwin district.

Ant-hills, especially the large and old ones, are generally crowded with parasites, of which the largest are rats and snakes. Whether or not these annoy the ants I could not ascertain, but the latter are powerless to remove them. Quite large snakes burrow into the hills, and a

multitude of the rats sometimes occupy these mounds, and I suspect prey on the pupæ. The rats I have found in the hills comprise numbers of all the native species except the large water-rat, and also the brown rat (*M. decumanus*). Of lesser creatures, such as lizards, centipedes, and beetles, the numbers in a hill frequently amount to thousands. All these, without doubt, prey on the termites and their pupæ, and the termites seem to have no power of retaliation.

Those insects, invariably called ants by the colonists of the districts where they abound, are one of the most intolerable nuisances of the country. They undermine everything that is constructed of wood, and houses have been known to fall as the result of their burrowing habits, while chairs, tables, and other articles of furniture are often exhibited as curiosities, the arms, legs, etc., being completely hollowed by these destructive insects, and the whole article reduced to a shell scarcely thicker than paper. Accidents often happen as a result of this hollowing habit of the termite, for it is impossible to detect the mischief done to beams, rafters, etc., until they give way.

All the animals and birds mentioned in the last chapter, with the exception of a few of the rarer kinds, were seen in this district, most of them in increased numbers. They do not require further mention here.

Although we lost sight of the party of natives who witnessed our start from the camp on the morning of the 20th, we heard others shouting and calling to each other all day long, their cries being often intermingled with the howling of native dogs which accompanied them.

Towards night a tribe of about thirty men and women with four young children came up to us quite fearlessly, and with but very few weapons in their hands. They had heard of my gifts to the tribe in the morning, and they came to beg. They expressed great friendliness to me, and begged that I would not go further into the interior, as there were fierce tribes there who would certainly kill me. These men, like those met with in the morning, were not particularly friendly with the boys in my service, and

the Chinese they completely ignored; but to myself and my white servant, Thomas Anderson, they were quite friendly. This did not prevent our being very guarded in our movements and keeping a strict watch all night, though I have never met with an instance of attack from a tribe that has been thoroughly friendly. The Australian black is not so treacherous as he is often described to be.

This tribe passed the night about half a mile distant from our camp, and did not attempt to follow us in the morning, though they again tried to dissuade me from continuing the journey. The males of this tribe, and all others I met with in the district, had a piece of reed pushed through the middle cartilage of the nose. It was more than a foot long, and projected beyond the face on each side like a well-waxed moustache. This singular custom seems to have been originally copied from a similar one amongst the natives of New Guinea, and to have gradually travelled to this region, the natives of York Peninsula being the first inhabitants of the Australian continent to adopt it. The operation of thrusting the reed through the nose is attended with considerable pain and loss of blood, but I could not discover that the custom, like the knocking out of teeth practised by some tribes living further south, has any religious significance, or is connected with the induction to manhood. Though these natives used a reed, a piece of wallaby bone or emu bone is more often seen in the noses of those who inhabit the country further to the south.

Continuing my journey in a south-easterly direction, we came about noon to a wide open plain, across which some columns of dust, occasioned by whirlwinds, were travelling at the rate of about twelve miles an hour, for a brisk breeze was blowing, though the weather was beautifully bright and clear, and quite hot, the wind moderating the heat but very little.

This plain was sandy and very sparsely covered with trees and bushes, though there was grass and some low, weedy scrub. Judging from the number of old fireplaces we saw, the spot seemed to be a favourite resort of the

natives, who were evidently more numerous here than in most parts of the country; but we did not see any this day, although we two or three times heard distant shouts, probably signals or warning cries from individual blacks who had discovered us.

Five or six emus were seen on the plain, and there were plenty of kangaroos and wallaby about. One species of kangaroo was large in size and light grey in colour; another large kind was, I think, *Macropus rufus;* but as neither of these large kangaroos were shot, I cannot be sure. Of the wallabies, several very small and very darkly-coloured animals were shot. These were, without doubt, of the *Petrogale concinna* species, and were found on a portion of the plain which was thickly covered with fragments of whitish-coloured sandstone. There was plenty of quail and other birds on this plain.

I tried to approach one or two of the whirlwinds, or sand-spouts, but, like a will-o'-the-wisp, they retired before me. They were not very thick, but about twelve feet high, and disappeared towards night, when the wind fell.

On the far side, towards the east, the plain rose into undulating ground, the highest being about a hundred and fifty feet high; and the ground was here so well covered with trees, that it presented the appearance for many miles of a forest. Cockatoos and parrots of many different kinds abounded in great numbers, as well as small birds and hawks of three species. In this wood we passed the night of the 21st without incident. But towards morning there was a very heavy storm of wind and rain, lasting until eleven o'clock in the forenoon, when the wind dropped; but it continued to rain heavily all day, and we were glad to take shelter with the most perishable of our goods in hollow-trees, the poor horses having to put up with a thorough drenching, which made them look forlorn enough. There was a very great fall of temperature with this rain, which made us all shiver with cold; and as we had not brought much heavy clothing with us, we had to wrap the blankets round our benumbed bodies. The Chinamen particularly complained of their misery, and I

have always found men of this race very thin-skinned; in fact, this was the only occasion on which I employed them as assistants on my travels, as they are useless in an emergency, have little pluck, and no faith in their master. One blackboy is worth three or four Chinese.

It was still drizzling at dusk of evening on the 22nd, and we had great difficulty in lighting fires. The night was fine and clear, but disturbed by many noises, of which the howling of the wild dogs was perhaps the most annoying. Other sounds emanated from birds, of which one seemed to be an owl and another a species of Caprimulgus, the incessant "mar-purk, mar-purk" of which reminded one much of the "more pork" of other districts. Nor was the screaming of fruit-bats wanting in this medley of uncanny sounds, the cold and wet having apparently much discouraged these at all times irritable animals.

Sometime during the night two of my Chinese servants deserted, taking with them two of the packhorses and a quantity of the most useful and necessary stores. As this was a serious loss, I was compelled, accompanied by "Shanks," one of the blackboys, to pursue the rascals. The black followed their tracks with perfect ease, and it soon became apparent that they were taking what they thought to be the shortest cut back to Port Darwin.

After riding about eight miles we came upon the bodies of the two men and one horse, all speared through and through by hostile blacks. The appearance of the corpses was horrible, and a large quantity of the flesh had been cut from the carcass of the horse—for food, I suppose. All that was eatable among the stores had been carried away; the rest lay scattered about the ground, much of it trampled and destroyed. According to the estimate of Shanks, my boy, about forty natives had been engaged in this murder, and there could be no doubt that they had been following and watching my party for a considerable time. The tracks of the missing horse showed that it had been led away by the thieves; but it would have been suicidal for me to follow after them. I

therefore rode back to the wood where I had left the rest of my little expedition under the charge of Anderson, my white follower, and, after thinking the situation over, I came to the conclusion that I could not continue the journey—at least on the intended plan. I consequently hurried back into the territory of the friendly natives met with two days previously, keeping a sharp look-out for the hostile blacks, whose success in killing and robbing the two Chinamen would doubtless whet their courage to the attempting of more daring enterprises. We, however, saw no men throughout the day, and on the 24th reached territory in which I felt quite safe, knowing that the natives, except when at war, never encroach on each others' hunting-grounds.

We could not find our friendly natives, and when I had disposed of my following in a safe and advantageous position, I determined to leave it in charge of Anderson, while I took a number of long, solitary rides in the neighbouring country. This I thought I could safely do, as I had a fairly good mount, and could therefore keep out of the way of any hostile blacks I might chance to meet. The only risks I had to face were surprises by night and the natural perils of a difficult country, but these I feared not to encounter.

I took with me as much food and ammunition as I could conveniently carry, and having given my final instructions to Anderson, started on the first riding ramble on the 26th. That proved a very wet day, which, I thought, was in one particular in my favour, as the natives generally seek shelter in such weather, and are not on the prowl for game or nobler victims.

I had to camp early myself, passing the night, as is usual in such cases, in a hollow-tree on a hill over a hundred feet high. The horse, hobbled and picketed outside, was very restless all night; and fearing that his nervousness arose from the presence of prowling blacks, I did not sleep, but sat with my gun in my hand ready for instant defence. When daylight returned I was not a little startled to perceive that the whole country as far

as I could see on every side had the appearance of a wide lake, with here and there an island, where the ground was high, rising from its surface. I thought that there could not be any great depth of water on the land; but it was clearly converted for the present time into a wet quagmire that would make very stiff riding.

The rain had ceased, and the morning was fine, bright, and not very warm. There was sufficient breeze blowing from the north-west to ruffle the surface of the water and give the waves the appearance of those of a great lake. It was certain that there could not be any blacks about, and with great difficulty I found the materials for making a fire, and boiled a billyful of water for tea. An hour later I saw a stream of smoke blowing from a hill similar to the one I was on some five or six miles distant. It was evident that the smoke of my fire had been seen by the blacks of the district, and mistaken for a signal.

Without loss of time I saddled the horse, and endeavoured to continue my ramble southward. At the foot of the hill I found the water much deeper than I had expected, and I soon found that I could not reach the plain on the south side without swimming the horse over very uncertain ground. In succession, I tried all sides of the hill, and found my retreat completely cut off. That the water was deep on the plain seemed to be proved by the number of animals that I could perceive, as the day advanced, had taken refuge on those spots of rising ground which were not submerged. On my hill, the superficial area of which could not have exceeded three hundred acres, there were several emus, and a host of kangaroos and wallabies.

Often have I desired to shoot emus and bustards, and found it impossible to get within range of those cautious birds. Now, when it would have been cruel and useless to slaughter them, I might have bagged nearly twenty. Wallabies were so numerous, and so crowded together, that I killed the two or three I needed for immediate use with stones picked up on the hill-side. Rats and other small animals swarmed all over the hill, as did lizards and

snakes, some of the latter being exceedingly poisonous. I killed about thirty of them, as they were so numerous that I feared to walk about among the trees.

During the day I saw no fewer than seven columns of smoke, which must have arisen from native fires kindled probably for signalling purposes, as the savages of this country generally covered their cooking fires with great cunning and skill, often making them in hollow-trees or in the midst of woods, where the smoke disperses before it can rise in a visible column.

For two days I was kept a prisoner on this hill, the quantity of water lying on the surface of the land being so great that it was quite unsafe to attempt to ride through it, as, had the horse floundered into a hollow or among submerged bushes, my fate would have been inevitable.

During this time I obtained plenty of meat from the birds and animals I killed; but there was so little herbage among the trees, that I was compelled to give nearly all my stock of biscuits to the horse. At first he refused to eat a thick dough made of flour and water, but on the second day was very glad to do so.

Although I had not previously seen a bandicoot in this district, several hundreds of them had taken refuge from the flood on the hill where I was prisoner. They were of two species, neither of which I can now record. These animals are very destructive—quite as much so as the most mischievous of European rats; and although they are marsupials, they are omnivorous in their diet. They, like the brown rat, will gnaw and eat anything and everything.

On the morning of the 29th the water had sunk away so much that I could see a tolerably good route to the south, and I once more resumed my ride in that direction. The country was simply awful to ride over. The horse sank in up to his fetlocks, and sometimes almost to the saddle-band. It was killing work for the poor animal, and wherever it was possible I dismounted and led him. By the time he was knocked-up, I had not proceeded more than eight miles from the hill of refuge; and we passed

the night on a much smaller elevation, which rose out of a sea of mud. The country by this time had the appearance of an extensive marsh, the water having so far evaporated that there now remained far more mud than wet. The land was well wooded with groves and scattered trees, intermingled with patches of jungle-scrub. The tall reeds which marked the courses of streams was beaten down by the heavy rain, and made the neighbourhood of the water-courses a forlorn scene. Large flights of ducks and other waterfowl flew through the air, and the groves were full of huge flocks of restless, screaming cockatoos. The stormy weather had evidently much disturbed some classes of animals. Every little rise of the ground I passed was crowded with creatures that were still seeking shelter.

On one hill a party of natives, wild with excitement, were slaughtering kangaroos, wallaby, and even rats and snakes, wholesale; while the women and children, squatting at fires, were indulging in a feast such as probably only fell to their lot on extraordinary occasions such as this. The shouting and screaming with delight could be heard for a mile or two across the plain, and the scene was altogether one of the wildest and most characteristic I ever witnessed. The men rushed about with savage alacrity, throwing spears, and beating with waddies, and shouting incessantly; while their wives and children clapped their hands and kept up a kind of screaming laugh, pausing now and then to snatch some dainty fragment from the glowing fire, and eat it as they squatted on the ground. So intent on their occupations were they that I passed near them without attracting the least notice. This I did very much against my inclination; but the dangerous condition of the ground left me no choice but to pass close to the rising ground or flounder in a deadly-looking marsh; and I am not sure that those blacks could have approached within spear-throwing distance. They were probably temporary prisoners, as I had been, on their little hill. However, if they saw me at all, they did not think it worth while to stop their sport to look at me;

and I, on my part, was very glad to escape attentions that may not have been of a very pleasant kind.

Unable to proceed far on that day I was compelled to pass the night at no great distance from my sable neighbours, whose triumphant and joyous shouts I could hear at intervals throughout the night. I found a dry spot on which to hobble my horse; and as I was pretty confident that the blacks were too well occupied with their own concerns to trouble about me, I ventured to light a fire, as there was a very chilly wind blowing; this wind, however, rapidly dried the land, and although there was a shower or two of rain the next day, I found far less difficulty in making my way across the country.

On the slight elevation of ground which I selected for my resting-place on this night, I shot a large water-monitor of the species *Varanus salvator*, called iguana by the Colonists. It was fully seven feet long, of which more than four must be allotted to the tail; and the colour was very dark, almost black, with slight stripings of dirty white. The monitors of this species are common in this district, and are also found in the intermediate country as far south as Gascoyne River; but I did not see or hear of them in the Champion Bay and Swan River districts. Further south the lizard, called an iguana (or "go-an-na," as the people will insist on calling it), is a much smaller creature.

But there is a "bob-tailed goanna," in the Champion Bay region which I also found in this Port Darwin district. This curious lizard is the stump-tailed lizard (*Trachysaurus rugosus*), one of the most curious-looking creatures on the continent. It is about fifteen inches long, with a remarkable flattened projection for a tail—as un-tail-like an appendage as it is possible to imagine. The whole animal, when squatting quiescent, would never be taken to be a thing of life; it looks rather like an elongated pine-cone. In habits the stump-tail is one of the most inanimate and sluggish of lizards. Run it cannot, and unless frightened and trying to escape, its pace is never greater than a lethargic crawl. Like other

lizards, it loves to bask in the sun; but the greatest part of its time is spent in its burrows, which are shallow, but often, in some localities, placed close together in little colonies. The food of this species is not very dissimilar from that of other lizards; but it eats vegetable matter, as well as flies and soft-bodied creatures of the worm and slug types. I do not think that it ever touches beetles; and I may remark generally that all Australian lizards which I have kept in confinement have been ready to eat food of a kind which they could not obtain in a state of nature—as crumbs of sweet-cake, syrup, and tiny pieces of raw and sometimes cooked meat, such food having been given to them when other was not immediately procurable; but cakes made with soda are very poisonous to lizards; and it is desirable, if the pet's health is the first consideration, which it always ought to be, to supply it, if possible, with its natural food. Lizards will always eat maggots and ant's eggs; and these, though not always procurable by travellers, may be bought in towns.

On the 30th of September I rode about sixteen miles in an almost due south direction through a country which may be described as a level plain, although there were certainly a few hills and undulations of the ground in places. On the whole the country was well wooded and the land evidently fertile; and the number of animals on the dry spots, and flight of birds in the air, were sufficient proof that it was well stocked with game. The number of native fires also, indicated by columns of smoke, showed that the human population was far above the average of an Australian desert region. I did not actually see any blacks this day; they were probably all far too well occupied in their slaughterings, feastings, and corroborees to be wandering abroad on the plain; and I rejoiced that the poor savage had found better employment than possibly murdering a lone traveller, who has certainly never wished them any harm, nor ever failed to raise his voice, in season and out, for the son of the soil.

I crossed several streams this day, some of which had the usual deep holes in their beds, with long stretches of

moderate depth between. Few had less than three or four feet of water at any parts of their course, and all were very full, so that it was often a dangerous thing to cross them. Once the horse was swept off his legs; but he very cleverly recovered himself, so that a good ducking was the worst I suffered from the mishap.

The banks of these streams were not steep, most of them being nearly level with the surrounding country. But there was much mud about, consisting of a mixture of sand and clay, and this in places was very slippery. All the streams contained abundance of fish, consisting of the spotted kind referred to previously, a kind of bream, cat-fish, and eels; and one of the largest, which may be styled a river, had a party of eight crocodiles (*Crocodilus porosus*) floating slowly in mid-stream. I do not know what river this may be, nor how far I was from the sea-coast; but these reptiles are seldom found above the lower reaches of a stream. These could not have been less than one hundred and twenty miles from the mouth of the river. Their presence made me hesitate to cross the river though I found a ford with not more than four feet of water on it.

Turning therefore to the east, I rode along the bank of this stream, and soon found myself bearing round to the north-east, and approaching a country where there were a greater number of hills than I had hitherto seen in this district. These hills had a singular appearance, being strewn with masses of loose rock of various sizes, but mostly small. The ridges often looked from a distance as if they were covered with large flocks of recumbent sheep.

On the plain there were a number of gouty-stem trees —one of the strangest vegetable growths of Australia. It looks like a monstrous production, being usually a pyramidal mass of wood springing from the earth to a height of twelve to twenty feet. From the top of this sprout a number of straggling branches which bear but a scanty crop of leaves; but the flower is a star-shaped, sweet-smelling blossom, and the fruit, large and egg-shaped, is a solid white mass, in which are embedded a quantity of flat

seeds. The fruit is pleasant in taste, and is one of the stock articles of native food. The tree does not seem to grow near Port Darwin, and I never met with it further north than on this unknown river, which probably is the Fitzmaurice, or a branch of it. The gouty-stem tree is always of scattered growth; I never saw them growing in woods or large clusters. Some of them are of enormous growth. One which I measured in the Gascoyne River district was forty feet in girth at the level of the ground, and sixty-three, nine feet above it. Some of the rougher individuals in settled districts take a mischievous delight in digging deep holes in these remarkable trees, which leads to their speedy death. Unfortunately, in Australia, the idle element does not always meet with that sharp magisterial correction which would teach it to respect the feelings of those who are desirous of protecting the native plants and animals, many species of which are so utterly unlike anything of a similar class to be found in other parts of the world.

Just before I hobbled the horse and camped for the night I saw a pack of six dingoes kill a large kangaroo, the only occasion on which such a sight was witnessed by me. Although these dogs are usually very noisy, and howl during both night and day, it would seem that they hunt in silence. I first saw these dogs in the distance, and I think they had only just started their game. They came straight towards me at a tremendous pace, the kangaroo making frantic bounds in its efforts to escape; but it made a perfectly straight run, and never once attempted to double. At most it did not run, or rather leap, more than three-quarters of a mile, before the dingoes were upon it. Two of them siezed it by the throat, the others behind. I think at least one dingo seized it by the root of the tail; at any rate, they had it down in an instant, killing it far more quickly and skilfully than I ever saw kangaroo-dogs kill one.

This happened at a distance of about one hundred and fifty yards from the spot where I had reined in my horse to watch the run, and the dingoes proceeded to tear their

prey to pieces without noticing my presence and apparently oblivious of it. When, however, I attempted to approach nearer, they retired to a distance, snarling and howling. Afterwards I camped close by, and could hear the dingoes quarrelling fiercely over the bones of the unfortunate kangaroo, which, though of large size, was not of either of the two largest species. As already stated, it is doubtful if the dingo ever dares to attack an "old man," or a red kangaroo.

While in the deserts on the west side of the continent scarcely a day elapsed but I heard the howling of dingoes, though the animals were not seen so frequently; and lest this circumstance should be construed into a contradiction of my previous assertion that dingoes are not so numerous as some writers appear to think, I may remark that these widely spread animals are in the habit of howling at all hours of the day and night, and as they can be heard a very long distance it is not surprising that their presence in a neighbourhood should be soon perceived. A pair of dogs, or at most a family party of six or eight, seem to arrogate to themselves the sole right of hunting over a certain district, and I have observed frequently that they resent the intrusion of others of their kind, except at certain seasons of the year. They often fight savagely together, and I have seen trapped, poisoned, or shot dingoes which bore many marks of former frays. Dingoes also have a habit of following travellers and parties of the natives; especially if they are accompanied by dogs, or half-tamed dingoes.

At the foot of the ridge on which I passed the night, there was a swampy wood of about four hundred acres in extent, the bark of the trees of which was covered with a luminous fungus or lichen, which glistened very brightly when darkness had completely set in. I have seen this fungus in several other parts of the country, not only on the west side, but also on the east, and especially in some of the swampy forests of North Queensland.

The same wood was haunted by a flight of bats, one of which flew against my lanthorn (suspended in a tree), and,

falling with the shock, was captured, permitting me to examine it closely. It proved to be of the same species as a well-known kind which is common in all the islands of the Indian Seas to the north of Australia—*Vesperugo abramus*. Here, at my camp, they were flying about until a very late hour. I do not think the last of them disappeared until the first streaks of dawn were showing in the east. They were attracted by my light, many hovering about the lanthorn, but only one actually touched it.

A large owl, almost the size of an eagle (undoubtedly *Ninox stremma*), also had its home in the wood, and disturbed me much during the early part of the night by its abominable screaming cry. It looked like a great spectre flitting to and fro often quite close to me, so that I could actually feel the wind of its wings. It was evidently annoyed at my presence so near its home, or perhaps the light disturbed it.

This owl is not common in any part of Australia known to me. I have seen it more frequently in the north than elsewhere. I remember a specimen being shot on the Clarence River, New South Wales, but I am inclined to think that this was a stray bird. About the 24th parallel seems to be its southernmost range of distribution. At any rate, I have never found it in any part of South Australia.

It is not a strictly nocturnal owl, for though it certainly hawks during the earlier portions of the evening and night, it is quite as often seen in the early afternoon and in the morning. The time of hiding, or rest, seems to be between eight in the morning and two in the afternoon. It is a bird that seems to be particularly fond of large-sized animals for its prey. The smaller wallabies are its favourite quarry, and I have never seen it attack the small rats and birds. It is a bird of rapid and audible flight—two characteristics that are very uncommon amongst the owls.

The night was close and hot, and the sky obscured with heavy banks of clouds, with almost incessant

lightnings, but no thunder or rain. Often I thought I could perceive dusky shadows moving about the plain near me, and I thought it wise to let my fire die out. I felt so sure that there were prowling savages in the neighbourhood that I saddled my horse in the dark, and rode off as soon as there was light enough to show me whither I was going, doing without other food for breakfast than a draught of water and a piece of dough made of moistened flour, which I ate as I rode along.

About seven o'clock I reached a spot where I could easily cross the river, which was here not more than twenty yards wide. Resuming a southward direction, I soon found the country rapidly assuming a hilly appearance. There were a few narrow valleys with abrupt hills enclosing them. These heights were covered with fragments of large rocks, like those previously mentioned, and some were very rugged and seamed with gullies which had the appearance of being water-channels during rains, though they were dry now. The 1st of October was a very hot day, and had the effect of rapidly drying the face of the country, so that, except for the circular, basin-like marks, left where the water had settled in pools, it was scarcely possible to perceive that there had recently been very heavy rains. Yet here and there I noticed broad sheets of water that were probably permanent, or nearly so—small lakes in fact.

A few of the hills were pyramidal, running to quite a sharp point; but most of them were flat-topped, and a few had a line of cliffs at, or near, the top. In the valleys and near the river there were groves of trees, but on the hills only a few scattered ones, and bushes. There was no continuous range of these hills, most of which were isolated elevations.

Near the river, birds of the plover and duck kinds were very numerous, especially a small brown whistling duck. On the plains there were many pigeons, also of a brown colour, and flying in flocks of two or three hundred each. One unfortunate lot came so close that I, being in want of something for dinner, fired amongst

them, and brought down a dozen with the two barrels; but they proved to be so small when plucked, that the lot was no more than a sufficient meal for a hungry man. However, kangaroos were so numerous that I had no difficulty in procuring one for a supply of meat.

Kangaroos, invariably stated in works on natural history to be nocturnal in their habits, are always to be found at any hour of the day. For an hour or two before noon and after it they usually rest, lying under trees, bushes, or amongst scrub; and during this rest they are very playful among themselves, the old males excepted. Where they have not been much disturbed by hunters, native or white, they will feed during daylight, though generally they prefer the dusk of evening for this purpose. The habits of species, however, vary, and locality has its influences.

Finding the features of the country very monotonous and unvarying, I turned homewards, making a big sweep to the north. As far as I could see from the top of a hill about seven hundred feet high, which I ascended at the end of the day's ride, the country was a poorly-wooded plain, with hills and ridges such as I have described scattered over it. The trees were small, and not even the banks of the one or two streams I passed had a fringe of wood along them. Possibly this country may be fairly good grazing land; it certainly, for Australia, is an abundantly watered district, and saline pools are not very prevalent. But it is not a picturesque region; and the comparative scarcity of wood is a great drawback, for in some places the scanty supply would not be sufficient for fuel. To the naturalist the country has its attractions, for it is thickly peopled with some of the most interesting forms of Australian animal and vegetable life, many of which I am compelled to leave unnoticed. Of the multitudes of parrots and water-fowl I have made frequent mention; in addition to these, there are in this district several of the brightest coloured of our finches or passeres, and several curious birds, as the brush-turkeys, etc., which have no representatives in other parts of the world.

Partly to avoid country which I knew to be inhabited by hostile blacks, but chiefly that I might view as wide an area of country as possible, I returned by a route lying much further to the east than that I had come by, thus entailing a journey of more than two hundred miles further than I need have travelled to rejoin my followers. But as I knew that Anderson would not expect my return for at least another week, and as I had no difficulty in finding grass for my horse, and could live myself for so short a time on kangaroo meat and birds, I felt no anxiety in thus prolonging my rambles. My horse was actually in better condition than when I started, and though it was certainly trying to be deprived of biscuit and flour food, I felt I could endure a week of such deprivation, especially as I was not altogether without vegetable food. Several fruits were growing in the country I have just described, though the gouty-stemmed tree was only beginning to burst into blossom. Flowers, I should have mentioned, though not very conspicuous, were blooming in considerable variety.

One of the best fruits of this district is a strange, plum-like berry, growing in clusters on a leafless tree. Each berry is as large as a thrush's egg, and of a similar shape, and the taste, though unlike that of any European fruit I have eaten, is a pleasant one. These berries, and another smaller kind growing on a kind of creeping bramble, were abundant, and afforded a very agreeable variation of my meat diet. Of the latter food I had as much as I required, for not a day passed in which I did not have the opportunity of shooting a kangaroo or wallaby.

Sleeping on the ground in dry weather, and with a good fire and blanket at one's command, is an experience that no good bushman would think a hardship, or, indeed, worth a second thought; and in such a country as this I am describing, in which water and fodder were procurable every day, the one danger and inconvenience arose from the uncertain temper of the aborigines. And these strange people are, in all parts of the country, exceedingly

variable in disposition. The tribe one meets and is friendly with to-day may to-morrow be succeeded by one of murderous instincts. But the wild blacks never having horses, a well-mounted traveller is sure of escape, unless he is surprised in his sleep.

On the 2nd and 3rd of October nothing of interest occurred. The features of the country were similar to those already described, and birds and game were such as is met with and has been described in the accounts of the Champion Bay and Gascoyne River districts. In the two days I saw perhaps a couple of dozen emus in three small groups, four large bustards, and two parties of natives. Neither of the latter took much notice of me, nor did either tribe attempt to communicate with me. The smoke I saw every day throughout this journey was proof that this is one of the best peopled districts of the continent; that is, so far as the native population is concerned. How it will be when the whites vastly predominate, I do not think it would be wise to predict. At present the white population at Port Darwin belonging, on the whole, to an official and well-educated class, is not likely to ignore the rights of the black men.

On the 3rd, after passing across some twenty miles of level plain tolerably well wooded, I again reached a hilly tract. Here the hills were nearly all crowned with a line of cliffs from eight to fourteen or eighteen feet high. The highest hill was about six hundred feet in height. Some of these elevations had steep faces rising abruptly from the plain. As usual, there were few trees on these hills, but a uniform sprinkling of bushes was spread over the slopes.

On these hills were a large number of ground doves of the long-crested kind (*Lophophaps plumifera*) scattered about in what I supposed to be family groups of ten or twelve birds. Each little flock was separated by a wide interval from others; and they never seem to congregate in large crowds; for I have seen these doves and other allied species on other occasions, and had some opportunities of studying their habits. Their gait and run is

just that of the quail, and they are so shy that it is with difficulty the sportsman can get within shot of them. They generally rise at a hundred yards, or at a greater distance if the gunner is accompanied by a dog; and as they take wing they utter a curious cry quite unlike that of any other pigeon or dove. Grass seeds form the bulk of their food; but I have seen them eating the thick fleshy leaves of a dock-like weed which covers some of the sandy patches on the highest ground. The doves avoid marshy or wet ground, and often may be seen squatting close to rocks which are quite hot in the blaze of the noon sun. Generally the bird has none of the usual habits of the pigeon genus. On account of the difficulty of approaching them, they afford good sport to the gunner, but they are very dry and indifferent eating as food.

A shallow stream which ran near the foot of the highest hill was covered with water-lilies; and I have seen these flowers in many other places in this district. The most attractive of other blossoms at this spot was a creeping plant bearing a small but very pretty scarlet blossom. All the flowers, which were numerous in kind, were small in size, the lilies excepted.

A marshy spot, which I suppose was the head of the stream, was thickly covered a mile wide with tall reeds; and similar reeds are found on the banks of all the waters, running and still, in this region. The marsh was the haunt of thousands of ducks of two kinds—a large darkly-coloured species, in which browns and deep greens were the prevailing colours of the plumage, and a small kind of a light grey colour. Owing to the denseness of the reeds, among which I could force myself but a very short distance, I could not study the habits of the birds, which I scarcely saw except on the wing; but many species of water-fowl found a home here, amongst others a large chestnut-brown ibis (*Falcinellus igneus*); another ibis, white with a black neck (*Ibis strictipennis*, I think); and several *Rallidæ;* also a small flock of the beautiful white egret (*Ardea garzetta*). The last named bird is not common in any part of Australia; but I have seen a few of these

birds in the Swan River district, and near Rockhampton, Queensland. It is more common about the Rockingham Bay district; but as I have never succeeded in finding its nest, it is probably only a bird of passage on our continent. A careful observer in this, as in any other country, will find that many species occur accidentally; and I may record that I succeeded in collecting forty-three species that are more or less common in India and Southern Asia, but have never been known to breed in Australia, or visit that country in large numbers; eight that are considered to be exclusively New Zealand species; fifteen from the islands of the Indian Archipelago; four from China; and six only from the island of New Guinea. Besides these I have found at least twenty cosmopolitan species. A few of these birds have been known to nest in various parts of the continent.

On the 4th the weather was so excessively hot that I was unable to travel between eleven forenoon and four o'clock in the afternoon. Having no instruments with me, I was unable to register the exact degree of heat; but that it was unusually great seemed to be shown by the extraordinary stagnation of animal life on the plain. The birds all ceased to fly; and, I suppose, hid away in the groves and beds of reeds. Kangaroos and wallabies crept under the thickest bushes, and where they could be seen, lay quiet, like dead animals, without indulging in any of their usual playful gambols. No living creature was moving about except insects. The gnats, which nightly had been an intolerable pest, cruelly torturing both myself and the horse, had disappeared; but in their place an army of tiny black sand-flies, showed that numbers make a "weak folk" formidable indeed. In addition to these, several kinds of flies not previously noticed suddenly made their appearance, amongst them a terrible species of horse-fly, which nearly drove my poor horse frantic. They swarmed upon him in such numbers that after many contortions and writhings and lashings out, he laid down on the ground and fairly rolled in his misery, the flies hovering about him in thousands, until he broke into a

profuse sweat. When he was covered with white foam the flies did not care to pitch on him.

The night was very close and sultry, and in the early morning there was a violent thunderstorm, with heavy showers. This drove away the insect pests, including the gnats which had made their appearance at dusk. The following day was sultry, but not so hot as the previous one; and I rode about twenty-five miles through a similar country to that already described, except that the only water met with was a few shallow pools left by the recent rain.

This day I met a party of natives thirty in number, of whom twelve were full-grown men. Some of them ran forward, dropping their spears, and gesticulating with their hands. Perceiving that they wished to speak with me, I thought I might venture to permit them to come up, and that it would be good policy to evince no fear of them.

They came on quickly, followed by the women and children, who, I noticed, picked up the dropped spears. Still, I felt no fear, for, though a different opinion exists amongst many persons acquainted with the Australian black, I have never found him treacherous. Others no doubt have had a different experience, but have they always recorded the whole truth? If he means outrage he shows his teeth at once, and without hesitation throws his spear. I have never known a case of his inveigling his victims with a show of friendship and then treacherously turning upon them *without provocation.* I am sorry to add what in justice to the blackman I feel I ought to. There is an opinion among the rougher classes of colonists that the black is always ready to sell his wife for a plug of tobacco or a peg of whisky. Sad to relate, this is too often the case in some parts of the country; but generally the native who has not been corrupted by the delights of the dram-shop is jealous of the virtue of his womankind, and the "treacherous incidents" we sometimes hear and read about have, almost invariably, their origin in just resentment of undue interference with the women.

To my surprise I found that several of these blacks could speak a few words of English, though I could not ascertain where their linguistic ability had been acquired. They could ask readily enough for "'bacca" and "matchum," and though I had but a pinch of the precious weed remaining, I gave it to them, and also my pipe. This pipe was rather an ornamental one, being embellished with the figure head of a remarkable species of goat, and the fellow who received it fully appreciated the gift, as the expression of his happy face plainly enough told. His envious mates crowded round him, and passed many, to me unknown, remarks of admiration of that wonderful head, while the almost naked women and children, squatting on the ground a few yards off, looked on, their mouths wide open in wonder.

I explained as well as I could that I had no more tobacco, or I should have been willing to give it to them, and they cheerfully offered me some food, of which they had an abundance with them, some of the women being loaded like pack-animals with it. But I would take nothing from them but a few warren-roots, which I was glad to have, as I was becoming tired of eating flesh so frequently. Considering the value of the friendship of these people, I was sorry that I had so little to give them in return for their kindness. I parted with everything that I could spare, which was little enough, as I had come to the end of all my stores, and had but a couple of dozen cartridges to last until I rejoined my companions, distant now, I hoped, not more than two or three days' ride.

From the expression "see before," repeatedly used by one of these men, I concluded that these blacks had seen me on my outward journey, and were perhaps one of those tribes I had avoided, fearing their hostility. I should explain that I was not sufficiently master of the native language of this part of the country to understand it without the aid of an interpreter. They now accompanied me some miles, I going, of course, at a walking pace to avoid seeming to wish to get away from them. At length their spokesman exclaimed, "Stop now. No further go,"

and offered to shake hands, a convincing proof that this tribe had had repeated intercourse with colonials. I shook hands with them all, and so we parted excellent friends.

Before they were out of sight the rain began to fall, and during the night there was another heavy thunder-storm. I took shelter as usual in a hollow-tree, but there was at this spot a large banyan-tree which afforded protection to the horse also, for the branches and foliage were so thick that scarcely any rain found its way to the ground beneath. This was the first banyan-tree I had found in the desert, and the furthest south I ever saw; but round about Palmerston, and in the extreme north, there are many fine specimens of this tree. Are they indigenous? or how did they get here? In my opinion, it is evident that, like the dingo dog and several other animal and vegetable productions of the continent, they were originally exotics. The seeds of the banyan may have been accidentally, or perhaps intentionally, introduced by Asiatic voyagers; but I think it is far more probable that they were brought by migrating birds. I base this opinion on the very scattered distribution of these trees. That they are not found in the southern parts of the continent is, no doubt, attributable to unsuitable climatic conditions.

Throughout the next day there were heavy showers at intervals, with clear, hot skies when the rain ceased. The heat was so great that I was unable to continue the journey, and during the night and following day I was too unwell to travel. The horse also appeared very jaded, and I attributed this and my own illness to the great heat.

For a day or two I was so unwell that I could not bear the exertion of riding much, and probably did not travel more than a dozen or twenty miles until the 11th of the month, when, having eaten nothing for thirty-six hours, hunger compelled me to seek food. This I found in the flesh of one of a couple of dingoes which came sneaking round my camp in the early morning. At any other time I should have been reluctant to taste such food, but the smell of the roasting carcass was savoury enough, and I

thoroughly enjoyed the meal I made off the flesh of this beast of prey.

During the day I got much better, and late in the afternoon made another stage on my journey. I soon became convinced that I had lost my way, the result of inability to pay proper attention to the route. I ought by this time to have been nearing my companions, but I could not recognise any of the landmarks for which I was looking. It was not until the 12th October was well advanced that I reached country which I could recognise. Duriug these last days I passed across some very sterile-looking tracts, but I never failed to find water—the necessary which is always the first consideration to an Australian traveller.

There being now no reason to husband the strength of my horse, I made a spurt, and on the afternoon of the 13th reached my waiting servants, glad enough to have access to those stores I was now so badly in need of.

Near our camping-place there were two "playhouses" of the bower-bird (*Chlamydoder nuchalis*), and I saw several others during my rides about the country, all of them north of the Gascoyne River. I do not know if these birds are found in other parts of Westralia, but there did not seem to be any in the neighbourhoods of King George's Sound or Swan River. On the east side of the continent I have found nests and playhouses of the satin bower-bird; but the bird is scarce in my native colony, though more abundant in Queensland. There are nearly a dozen species and varieties, few individuals if any of which are found in the south of the continent. Most of them have spotted plumage, but that of the satin bower-bird is black in the cock, and greyish-green in the hen, inclining to yellow on the belly. The young, however, are speckled, and the cocks are not in full black plumage until their third year.

The playhouses are quite distinct from the nests which, with most species, are placed in bushes, or in the hollows of decayed trees. The young are four or five in number, and the eggs in some species are greenish,

speckled with grey or dull brown. One or two species lay eggs which are not spotted.

They do not all make playhouses. Two varieties clear open spaces in the bush which may be as much as twelve or fourteen feet in diameter, and on these twenty or thirty birds often meet to parade or "dance," apparently for amusement. The cocks of one species amuse themselves with building spare nests which are never used for breeding purposes. At least six species make playhouses; and no person who has watched the antics of the birds when assembled at these can doubt that amusement is the sole object of the little creatures in constructing them.

The playhouses in the Port Darwin district were made of small twigs set very close together, and sloped so that the tops just met at a height of twenty inches. Inside, the house was lined with fine grasses, roots, and filaments of a kind of cotton procured from a species of *Bombax* which grows in the neighbourhood. There were also a few brightly coloured feathers interwoven in the lining; and the sides of the house were so compact that the birds could not be seen when running through it. Hundreds of small shells were strewn about the floor of the house and on the ground near it, covering an area of six or seven square yards. Some of these shells were marine, and supposing them to have been brought from a river estuary they had been fetched from a distance of at least a hundred miles. But they might have been brought from other playhouses, and so have gradually found their way up the country. The feathers, few in number, were all those of parrots, red, green, blue, and yellow in colour.

There were houses in an unfinished state about this country, but I could never surprise the birds at work upon them, and I do not know if a house is the work of one or of several birds. Probably the latter is the case, as sometimes several birds play about the same house, chasing each other through it, fluttering their wings, uttering lively cries, and occasionally flying in a flock over the structure, which here was thirty inches long and

seventeen wide, so that several birds could fly through together.

Sometimes a single bird amused itself for hours at a time at one of the playhouses, carrying the shells through the house from one side to the other. If two or more birds were present at the same time they invariably chased each other in a playful manner, and sometimes a squabble arose among them, which seemed to be a kind of mock fight.

Sticks, coloured stones from the hills and river banks, fruit stones, berries, a metal button, a small piece of tin, a piece of native twine, and a number of wallaby teeth, were among the numerous articles lying about these playhouses.

CHAPTER XIX

A LONG RAMBLE IN QUEENSLAND

I MUST hasten to Queensland, a colony which, as it adjoins my native country, I have naturally visited more frequently than any other part of the continent, and as I, for a time, possessed a stock-yard within the "frontier lines" of the queenly settlement, I have had opportunities of a prolonged study of the native life of the region.

Of course the convict had a leading hand in the founding of Queensland, and equally of course there is a good deal that is sordid in the early history of the colony. It is so with each of our five great States of the future. Forgive the word "five," little Tasmania. Though small in size thy position may one day make thee great in reputation. Without another word, I must drop references to the history of the great northern colony.

Viewed as a whole, Queensland is a characteristically Australian country. It is as remarkable as any other of the great divisions of the continent for animal and vegetable curiosities and eccentricities and variations of natural features, but its position under the tropic of Capricorn has a marked influence on all its productions, and in no other part of the land can a more luxuriant growth of vegetation be shown than in Queensland.

There are, or perhaps I should say were, in this colony the thickest and most extensive forests on the continent. Many of these have been burnt to clear the land, others felled for their valuable timber, but to a recent date, at any rate, many large woods remained in the least accessible parts of the country. Much of the land is very park-like

in general appearance, the trees growing in clumps and groves rather than in woods; but where it has not been interfered with, there is always a wide belt of trees on the banks of the rivers and streams; and in the interior, towards the north, several valleys of great width are occupied with unbroken forests, some of which are more than a thousand square miles in extent.

In 1890 I joined a party of squatters on a prospecting journey, with the view of examining the country lying westward of the Burdekin River. Wide as the colony of Queensland is, there was, even so long ago as 1891, but very little good land unoccupied—at least in an accessible position. Successful stock-raising requires wide areas of ground in a country like Australia; and this north-eastern part of the continent is subject, in spite of the beauty and fertility of a great portion of it, to disastrous droughts, which try the capitalist severely. His best chance of averting disaster in these times of trial lies in his having extensive tracts to move his cattle over. Hence estates of 60,000 acres are quite common, and this means that the landed proprietor has, with back-runs and common rights, something like 200,000 acres at his command. All his days, however, are not passed in sunshine. Often, when he begins to prosper, there comes along a peculiarly wretched type of "squatter," who, taking certain advantages of the land-laws, makes a claim of the choicest portion of the stockman's back-run. This person has no intention of setting up as a stockman himself; he has neither the inclination for, nor the means of doing that. What he wishes is to be "bought off" by the rich proprietor, and bought off he invariably is. Then he departs to practise his mean tactics in some other locality.

It was to prevent the possibility of such a black-mailing interference that eight stockmen, of whom two were my near relatives, undertook the expedition referred to above The object was to secure, by a joint occupation, all the good land lying behind the estates of three members of the party. I joined the little band, as much for the

purpose of indulging my prevailing taste, as from the wish to forward business.

The rendezvous was beyond the river Burdekin at Clark's station, the home of one of the overseers. Besides the eight principals of the party, three stock-riders, and four blackfellows, servants, were taken with us, forming a well-mounted, well-armed party of fifteen persons, with six pack-mules.

The country around, and for sixty or seventy miles inland to the west, was fairly well known to the riders at the station, and several outlying parts had already been established; but it was our intention to push out considerably beyond these, with the object of thoroughly examining the country, and forming an opinion of its value as a cattle run. There was known to be good grass land to the west, but only surface water, with a few wells with wide intervals between them. The real value of the land depended on the discovery of permanent water, and as water in no uncertain quantity is the first need of a stock-farm, the time chosen for the journey was the winter, or wet season, in order that we might judge what quantity of this necessary would be procurable at the most dangerous season of the year. The start was made on the 22nd May.

The country near Clark's station is level, and tolerably rich in grass, and there is a fair sprinkling of trees, mostly in clumps and small woods; but the sides of some of the gullies are thickly clothed with trees. The gigantic gums of this district are not so gigantic as those of Victoria, but they are fine specimens of their race; and even here, on the borders of the desert, there are some good examples of the *ficus* genus, with most picturesquely twisted and gnarled trunks. Nearer to the coast some of these fig-trees grow to an enormous size and height, and are, indeed, to be classed amongst the finest and grandest-looking trees of Queensland.

The first day we rode about thirty miles, and so thoroughly had the kangaroos and wallabies been cleared off the land, that we did not see a single animal of either

of these families. Great efforts have been made in Queensland to reduce the number of grass-eating wild animals (kangaroos and allied forms), and large sums of money have been wasted in efforts to destroy them wholesale. It is almost entirely owing to private effort that the numbers of these animals have been reduced, and in some localities exterminated. It was hoped by means of a wire fence of immense length to prevent the rabbits from spreading from New South Wales northwards, but this was an utter failure, as might easily have been foreseen. The rabbits have migrated into South Queensland, where they are numerous enough, and they will spread over the entire country in spite of the drastic penalties inflicted for such offences as permitting rabbits to escape from captivity or wilfully turning them loose, amounting to as much as £100 for a repeated offence.

The dingoes are far less numerous in Queensland than they are on the opposite side of the continent. They have been shot, trapped, and poisoned, till comparatively few remain.

Crocodiles infest most of the big rivers in the northern parts of the colony, but these also have been much thinned by the hand of man. It is asserted that they will seize and drown bullocks and horses; but no such incident ever came to my knowledge, nor have I ever known of a fatal accident to human beings; yet some of these crocodiles are quite eighteen feet long. The average of fully grown reptiles is fourteen or fifteen feet. The species is the same as is found in the Port Darwin district, the estuarine crocodile, which it is asserted in "popular natural histories," often goes out to sea, and is rarely found far from the mouths of rivers. In Australia I have never seen or heard of its being found in the sea; and though it mostly frequents the lowest reaches of rivers, it is often found almost up to the sources of many streams; and the only limits to its wanderings into the interior seems to be the shallowness of the water in the upper streams. Fish forms the bulk of its food, and though it probably often surprises ducks and other aquatic birds, I very much

doubt if it habitually feeds on terrestrial species of animals. I have found the broken shells of water tortoises in the stomachs of several that I have shot. The largest of these reptiles was eighteen feet five inches in extreme length. There were five toes on the fore-foot, the four first being deeply webbed, the outer one unwebbed; four toes on each hind-foot, the three first deeply webbed, the outer one half-webbed; eighteen teeth on each side of the upper jaw, fifteen on each side of the lower jaw. The teeth were very unequal in size and length, the largest being two inches long. This crocodile, in the deep furrows of its hide and rough appearance of the scales, etc., gave indications of being very aged. I caught it in shallow water in a billabong of the Wickham river; but it was not killed without much trouble, and I found that a shot through the body just behind the fore-leg was more fatal than one in the head.

The Australian crocodile lays its eggs in the sand among the reeds on the banks of rivers, sometimes at a great distance from the coast. I have found them on the Burdekin River, for instance, which is quite an inland river—the greatest part of its water, being lost in desert sinks. The exposed sand-banks in the midst of rivers are also favourite resorts of crocodiles for breeding purposes. The number of eggs laid is about twenty, and they are incubated, the crocodile always passing the night squatting on the buried eggs. It is also often in this position during the daytime; but I could never learn if it is the mother, father, or both parents which perform this office; nor am I sure whether the animals pair or are polygamous. I have sometimes thought that the latter is the case, but I have no certain evidence of it. The young crocodiles when first hatched are very small and only four or five inches in length. The mother watches and tends them, and is, while thus engaged, exceedingly bold and ferocious. At other times these reptiles seem timid and anxious to avoid man; they have probably learned here, as they are said to have done in other countries, that the lord of creation is a dangerous antagonist.

Our second day's journey brought us to a well-grassed country, which seemed admirably suited for a cattle-run, but was at present a back-run in the joint occupation of several stockmen, who had together about eight thousand head of cattle upon it. Beyond this point no man of our party knew the country.

During our two days' ride I noticed several trees common on the other side of the continent, which varied curiously here. The grass-tree, for instance, has a still more singular appearance than it has on the west side. It is here without the long central stick, but has instead a curious matted mass under the grass tuft, and from a short distance looks just like the enormously gigantic head of a blackfellow stuck on a post. The appearance is really sometimes quite startling.

Then the gouty-stem tree in this district, though still greatly swollen, has a symmetrical shape, looking like a huge beer-bottle with a plant stuck in the neck. It is called by the colonists the bottle-tree, and is clearly a distinct species from the common gouty-stem.

In sheltered gullies, and sometimes in ravines on the hillsides, I found the fruit called the native plum, and also the native cherry (*Exocarpus cupressiformis*), and several other fruits and nuts which are largely used by the natives for food.

Among the most prominent trees I noted fine specimens of the iron-bark (*Eucalyptus resinifera*), on which the fig-tree is often a parasite. These were sometimes a hundred and thirty or a hundred and forty feet high, and twenty-five or twenty-six in girth.

We passed, too, several nettle-scrubs, in which the nettles were seventeen or eighteen feet high, with leaves the size of large fans; and though ferns were not so numerous as on ground nearer the coast, there were some fine displays in the gullies, the fronds of many kinds being exceedingly delicate and lace-like, and of most beautiful tints. These fern-gullies are favourite resorts of a multitude of small birds, and also of parrots and cockatoos, and have unpleasant inhabitants

such as snakes of poisonous kinds, and other unlovely creatures.

The number of snakes in Queensland is enormous; I have recorded fifty-three varieties, and I learn that this great number does not exhaust the list. Every gully and scrub in the unoccupied parts of the colony swarms with them. Four or five species are poisonous, the diamond-snake being the most dangerous; yet I never heard of an accident with these reptiles. The dangerous kinds retire very quickly before the advance of the colonists, though occasionally one hears of the deaths of cattle and horses through the attacks of the diamond-snake, which is the most aggresive. As a rule, all kinds endeavour to escape on the approach of man, they having probably learned caution from the continual persecution on the part of the blacks, to whom a dish of snakes is a much esteemed luxury.

We all lay out on the open ground on the night of the 23rd with picketed horses, and most of us, I think, slept soundly until we were awakened at dawn by the noisy screaming of thousands of cockatoos and parrots which wheeled about in the air above us. One of our party amused himself by shooting at them as they flew past; but he did not make a heavy bag, for the whole of them quickly flew away on the loss of two or three of their number.

At this spot we were dependent for water on a well which had been previously dug by some of the stockmen; but the supply was limited, and we had to wait our turn in watering our horses, while the water slowly percolated into the cavity, which was about twelve feet deep. Probably there would have been a more abundant supply of water if the well had been dug deeper.

Still continuing to the west, we rode another thirty miles on the 24th, the character of the country undergoing a considerable change. The grass gradually became shorter and thinner, until it ceased to grow altogether, or only in deep depressions of the ground, and a thickly-growing creeper took its place, covering the surface of

the ground for many miles, and in spots being so deep and tangled that it was a serious hindrance to our advance.

Trees began to appear stunted and withered, and not numerous on the plain; but where the ground rose a few hundred feet above the level, it was covered with a thickly-matted forest growth. On the plains there were bottle-trees, but no grass-trees. Near the forests we saw some splendid specimens of *Augustifolia*, with clusters of its blossoms ten feet in circumference, one of the most lovely sights of the district, though here were many magnificent flowers of all shades; and it seemed to me that never before had I beheld such vivid scarlets and blues, crimsons and yellows.

The country in this neighbourhood is intersected with ranges of low hills, beyond which we could perceive mountains of unusual height. The outlines of these ranges were similar to those of all other Australian heights. The majority of them were flat-topped, while there were a number of isolated conical hills with very sharp summits, reminding one of the crude effort of a child to draw mountains. In one particular they differed much from similar hills on the west side of the continent—they were often covered with trees, which, although not growing in what may be called dense forests, were generally rendered almost impenetrable by a thick under-growth of creepers, nettles, and a peculiar kind of reed-like plant springing up into sticks more than twenty feet long. Many of the creepers were gay with blossoms of many different hues, while parrots were crowding in thousands on the trees; and one of our party, who was an adept in the use of the gun, with very little assistance from his mates shot enough in an hour to provide us all with a supper.

The night was passed under the lee of a huge citadel-like rock crowned with an abrupt line of cliffs, which was thought to be nearly fifteen hundred feet above the surrounding country. My particular "chum" and I spent the evening in an attempt to ascend this mountain, and we climbed

high enough to obtain a very fine view of the country to the north and north-westward. In these directions many high hills and cliffs could be seen, and also a wide plain, across which we could see at least sixty miles in the marvellously clear air of this part of the country, which has probably, on the whole, the finest climate in the world. The land was well wooded, and had the appearance of a fine pastoral country, which indeed we afterwards found it to be.

About the foot of the hill there were a few wallaby and kangaroos of kinds common in New South Wales, including the great kangaroo, or "old man"; but they were very wild, a pretty sure indication that they had been much harassed by man; and we succeeded in shooting only one small wallaby. Emus and a cassowary were seen, and a rifle-shot or two fired at them, but none were obtained. All the parrots hitherto seen were of kinds found in the southern colony.

It was decided by show of hands that the party should not proceed any further in the direction of the interior, a decision which disappointed me much, as I was most anxious to explore the country in that direction. However, I was bound by the decision of the majority, and when the start was made, it was towards the favourable-looking country to the north. Over this district we rode sixty miles in two days, and found the soil rich and covered with a kind of kangaroo grass, with patches of creeper and jungle scrub—in fact, a very good land for the stockman's business, but lacking in water. The only pool we found was a stretch of mud a dozen acres in extent, with a dirty puddle in the centre. We saw at a glance that cattle had been there, and soon found that the country had been known and used for some time by several stockmen from the neighbourhood of Bowen. We met two of their riders, and saw several thousand head of cattle.

The riders were very chummy, not having seen a white face, they assured us, for eight months. They were expecting to have a relief sent immediately, when

I suppose they would proceed to Bowen, or some other township, and "lamb down" (*i.e.*, waste in drink) the wages due to them. Wages are almost invariably paid by cheques. These cheques are handed by the recipient to the landlord of the inn where the drunken spree takes place. That individual nearly always contrives to delay handing the change to the customer until the latter is too drunk to see clearly, much less to count, and by and by the foolish fellow is turned out of the house penniless, robbed by the innkeeper and the loafers who live on the hard-working fools, who seem to become temporarily insane the instant they enter a dram-shop, so madly anxious are they to "shout" for, or treat, any dirty fellow who chooses to sponge on them. It may seem a drastic suggestion, but it would be a wise and just regulation if bankers were requested not to cash stock-riders' and shepherds' cheques when passed through the hands of innkeepers. I do not mean that all colonial innkeepers are dishonest men. I do not hesitate to say that those of them who permit farm-servants to "shout" on their premises are.

The first thing our two friends asked for was whisky, of which, however, they obtained but little, for most of that brought with us had already been drunk. A life in the wilds seems to breed an irrepressible longing for fiery spirits; and I regret to say that, outrageous as are some of the tales I have heard or read of American topers, we have men in our country who can claim, without boasting, to be the heroes of far more dreadful orgies than any of those related of American cow-boys. Whisky by the glass and the bottle! There are seasoned stock-riders and miners among us who would think scorn of sitting down to a less quantity than a pailful, and there is an authenticated instance of a party of five miners who had a thirty-six gallon barrel of whisky sent up to camp to them, and on its arrival never left it until they had drank every drop. Strange to say, they survived the hoggish feast, which is a good illustration of the extreme toughness of the Australian miner.

Our newly-found chums directed us to a well where there was plenty of water, but when we arrived there we found some swagsmen (tramps) had carried away the bucket, and we had to draw the water and fill the trough with our billys, which was slow work.

The swagsmen are often a great nuisance in all parts of Australia. They now (unless really honest men in search of work) keep on the outskirts of the settlements; and if they take offence at the refusal of a squatter or stockman to give them food and lodging, they never fail to commit some outrage to show their displeasure. They fire the outhouses, break down the fences, open the stock-yard gates, and commit a dozen other acts of mischief. Of course if they are caught the punishment is sharp, and even for the minor charge of vagrancy they seldom get off with less than six months' hard labour; but it is very difficult to bring home the graver charges of incendiarism and wanton destruction to them. It is one thing to be convinced that you know the offender, quite another to prove in a court of justice that he is an offender.

This petty annoyance of carrying away the bucket from a well is very common among swagsmen. In the case just mentioned, we found the broken bucket ten miles away. The fellow had evidently carried water to his next camping-place, and having used it, had wantonly smashed the bucket.

In this plain there are no rivers, and water cannot be found at a less depth than fourteen to eighteen feet; but in summer, when violent rain-storms occur, there is plenty of surface water. Then the herbage is very luxuriant, and there is a moderate quantity of grass all the year round.

The object of the expedition being thought to be now accomplished, the party proposed to return home immediately. Accordingly, on the 27th the majority of them started on the return journey, but I and the gentleman who had been my particular chum or friend, and whose tastes were similar to my own, agreed to examine the country more closely than could be done in

a hasty ride across it. We retained with us one of the white servants, and two of the blackfellows, and after a day's rest at our last camping-place, restarted still in a northerly direction.

On the 29th my companion and myself rode in a leisurely way some sixteen miles in a valley between two lines of cliff-like hills from six hundred to seven hundred feet high, the flat tops of which were covered with tall trees, many of them bunya-pines with cones thirty inches in diameter. In the valley, among other fruits we found the native-cherry, celebrated all over the world for its curious berry, bearing the stone outside instead of surrounded, as usual, with the pulp.

Half-way through this valley we crossed a gully full of mud-holes, which bore signs of being a deep river in the wet season. At present there was only an inch of water in some of the holes; but by digging in the mud we obtained a plentiful supply. The banks of the gully were ninety feet high, and the wash-line showed that the water had at some time risen almost to the top. Probably after heavy storms this river is a rapid torrent, flowing from what appeared on a distant view to be a mountainous range fifty or sixty miles to the westward of our position.

For the first time during our journey we saw a party of natives, sixy in number, with women and children. They stood and watched us pass, but did not attempt to approach nor to follow us. Later in the day we saw twelve men, perhaps a detachment of the same tribe, watching us as we passed a native sepulchral grove in which about a dozen dead bodies were placed in the trees. The Australian natives, like all other men, are very jealous of interference with their dead; and we noticed that as soon as we had passed this grove, the twelve men turned and went back towards the south.

The following day we crossed another river-bed, in which there was more water than in the one described above. This was evidently a branch of Mitchell's River—perhaps the Lynd River. Its banks, which were steep, and the country on each side, were well clothed with

timber-trees—iron-bark and other gums, and a variety of curious and peculiar shrubs and trees which are not found in the southern parts of the colony. Here there was an immense variety of flowers, many of them remarkable for strangeness of form and beauty of colour, but not one possessing a pleasant scent, though one or two had an exceedingly objectionable odour.

For the next day or two we were passing through a fertile country with woods and park-like scenery, and here and there the partly dry bed of a stream. On these beds we were dependent for a supply of water; for though few of them contained much more than mud in various stages of dryness, we could generally obtain good water by deepening the holes a few feet. Occasionally bushes and trees were seen growing in the beds of those streams—a sure sign that they were only occasionally filled with running water.

While travelling through this country we saw small parties of the natives nearly every day, each consisting of about twenty men, and as many women and girls, with five or six children. Native fire-places were seen all over the plain, so that this must be an unusually well-peopled district; yet game is not as abundant as it is in the north-west. Vegetable productions are perhaps more numerous. The bunya-pine is much relied on by the blacks for a nourishing article of food; insomuch that the tree is protected by the Colonial Government on their behalf; and the warren, or native yam, is very abundant. The blacks cultivate this vegetable; and we passed some warren-grounds which were quite eight acres in extent. The palatableness of the warren-roots is a matter of taste; but without question they are a very sustaining and valuable food for the natives, and on occasion the whites are very glad to eat them.

On the 3rd June we had reached a large river, which we thought must be the main stream of the Mitchell. It was about forty yards wide at this time, but there was evidence that it was a much larger stream in the wet season. It was now easily fordable everywhere, as there

were many dry banks in mid-stream, and the water only averaged two feet deep. The fish seemed to be suffering from the heat, as they were crowded into the deep holes. We caught a few dozens of them, consisting of bream, cat-fish, and the five-spotted fish described in the chapter on the North-West region.

On the 3rd of June I saw for the first time that curious creature the Australian dragon, or frilled lizard (*Chlamydosaurus Kingi*), a remarkably specialised creature, insomuch that it habitually waddles about on its hind legs, and never runs on all fours like other lizards. It is a large lizard, often growing to a length of nearly a yard, not more than a third of which is allotted to the tail. It is of sluggish habits, and lives among the scanty scrub in barren, sandy spots. It does not appear to dwell in holes, or to resort to them for protection; and its only means of defence appears to consist in its huge frill, which is dilatable, and when extended completely conceals the animal from an enemy advancing in front. It also tries intimidation as a means of defence; and I have proved that this is successful in protecting it from the attack of snakes, which are probably its chief enemies. When an enemy approaches it, it still retains the upright position, and lashing furiously with its tail, grins in an appalling manner, exposing all its teeth; yet when seized it never makes the slightest attempt to bite, and may be handled with impunity. Its food consists of insects of all kinds, and also other lizards; but, like many other reptiles, it goes long intervals of time between its meals. In captivity one meal in six weeks' time is sufficient to keep it in health, and it probably does not feed more frequently when at large. It is not an abundant reptile.

Other lizards are very plentiful in species and numbers throughout this district, the most abundant being two species of the *Ablepharus* genus, both of very small size and active habits; and the monitor (*Varanus salvator*), which is more abundant here than in Western Australia, and also, I think, more aquatic in its habits; though it is, in all parts of the continent where it is found, more often

met with on land than in the water. I have found specimens at a very great distance from water or moist ground.

I cannot attempt to describe the mammals and birds of this district, there is such a multitude of species. Nearly all the species found in New South Wales, and most of those of Western Australia, are more or less common here. Cockatoos and parrots swarm, the common lemon-crested (*Cacatua galerita*), the slender-billed (*Lichmetis nasica*), and the red-breasted (*Cacatua roseicapilla*) being among the most abundant in the Mitchell's River district. Here also we shot several of the remarkably coloured, blood-stained cockatoo (*Cacatua sanguinea*). The black cockatoo of this district (*Microglossus aterrimus*) is a different species to the birds of this colour found on other parts of the continent, and is by far the largest bird of the parrot genus found in Australia. Its formidable, sharp-pointed beak measures more than three inches along the curve, and it is dangerous to pick up a slightly wounded bird, as the wound it inflicts is a deep and clean cut as that of a knife.

This cockatoo, which is not so deep a black in colour as some others of the genus, having a greyish tinge on a great part of the plumage, is much larger than the scarlet macaw. It is a comparatively scarce bird, and never collects in large flocks like other cockatoos, about a dozen being the greatest number I have ever seen together; more often the groups contain five or six birds only, while pairs, and single birds are frequently met with. It is a solitude-loving, forest-haunting species, only rarely visiting the open plains, and always exceedingly shy of the approach of man.

The remarkable length, strength, and fineness of point of the beak, have attracted the attention and conjectures of naturalists ever since the bird has been known, and Dr Wallace has given an elaborate description of its special use in enabling the cockatoo to extract the kernel of the canary-nut. This description is ingenious, but will not hold good for the Australian bird, in which country, so far as I have been able to discover, the canary-nut

(*Canarium commune*) is unknown. In another point also, I must differ from Dr Wallace. He says that the bird is easily killed. Really it will carry as much shot as a swan. In Australia its food consists of leaves, buds, blossoms, and all the fruits and nuts of the northern region, including the kernels of the bunya-pine cone; and I have seen them searching the rough wrinkles of the bark of trees in search of the larva, etc., of various beetles, and other insects. The slender-billed cockatoo has the same habit, and as its beak is very long, and terminates in a sharp point, like that of the large black cockatoo, it seems likely that the beak has acquired its peculiar shape in both cases from the particular habits of the bird.

The great black cockatoo breeds, like all others of the genus, in the hollows of trees, always in the seclusion of a forest or large wood, and always at a considerable height from the ground. The eggs, which are two in number, are of the typical parrot shape, and quite as large as those of a hen. I have never found the young birds. In May and June most of the parrots and cockatoos in the Mitchell's River district were just beginning to breed. Many nests had eggs in them; but all these were freshly laid. I use the word nests advisedly, for while Australian parrots are not strictly nest-makers, most of them make some slight preparation in the nesting-hole. In the case of the great black cockatoo, there is a quantity of the dust of decayed wood spread at the bottom of the hollow, which is usually six or seven inches deep, the bird having scraped it down from the sides of the hole in which the eggs are laid, and this to some extent is plastered together with the excrement of the young or old cockatoos, who appear to use the same hole year after year.

The slender-billed cockatoo often places a layer of dry leaves in the breeding place, and in other cases (I am not sure of the species), I have found a little grass under the eggs of a cockatoo.

I must notice one more highly characteristic bird of the north Australian fauna—that is the cassowary. Though

cassowaries are found on several islands of the Indian seas, and also in New Guinea, not a great distance from the spot where my study of the bird was made, yet the cassowary of each district or island is said to be specifically distinct, and is certainly at least a well-marked variety.

The Australian cassowary (*Casuarius australis*) has a very limited habitat, not being found south of the tropic of Capricorn, except as an accidental wanderer, and but rarely, at the present day, wandering south of the twentieth parallel. To me it is a very puzzling bird, and it is difficult to perceive any use of the extraordinary horny crest, which, with its remarkable skin colouration about the throat and neck, are its two most prominent characteristics. How this horny crest and this bright colouring were acquired it is impossible to conjecture, and it is certain that no definite conclusion could be arrived at unless we had particulars of a long line of the bird's ancestors—a knowledge, it may be taken for granted, which will not now ever be acquired by the evolutionist.

I am not sure that the cassowary is not the largest bird on the Australian continent. It stands higher than the emu, is stronger on the leg, and often quite as bulky at least, as that bird. But it is shorter bodied than the emu, and habitually stands more upright. It is also a swifter runner than the emu, and a far more intelligent bird. Cassowaries are not often found as pets among the colonials, probably owing to their scarcity and limited range; but where they are they invariably show a marked attachment to their masters, and, indeed, to all that treat them kindly. Sometimes a tame cassowary will follow its master about like a dog.

In a wild state they are never gregarious. Solitary cassowaries are frequently met with, especially when the breeding season is well over. During the breeding season the birds are mostly met with in pairs. They are not nearly so prolific as the emus. Three or four eggs is the number laid. They are placed together in a slight hollow of the ground, generally well hid in thick scrub,

and are of a very dark green colour. It is only by the darkness of colour that I have usually been able to distinguish cassowary from emu eggs, the latter often being light green in tint. As with the emu, it is the cock bird which incubates the eggs and generally looks after the hatched young; but both parents remain with the brood until the young are fully grown or nearly so. Thus, when the breeding season is well over, five or six cassowaries may be seen together, and this is the greatest number I have ever seen in a flock.

The cassowary is a shy and wary bird, and it is but rarely that the natives succeed in killing or capturing the fully grown ones. The young, however, are sometimes caught by being driven into pitfalls from which they cannot leap like their parents; and some of the young are killed by dingoes, though these animals run great risk of attack from the old birds.

Contrary to the general assertion of popular works on natural history, the Australian cassowary is not a forest-haunting bird. It prefers scrub-covered country, and its range of vision is very great, and its power of scent not less acute. It is almost omnivorous in its diet, though fruit and vegetable substances seem to form the bulk of its food. It will, however, pounce upon any stray rat or lizard that comes in its way; and I have seen one seize a water tortoise, and, with one well-directed blow against a stone, smash the shell and then swallow the unfortunate animal as a thrush will a snail. The emu has been seen to do the same thing; in fact, both species eat a quantity of animal matter, just as both eat berries and scratch the ground like hens in search of roots and minute substances, the nature of which I could not ascertain, but which are probably the larvæ of insects, eggs of worms, flies, locusts, etc.

The cassowary has the habit of rolling in dust and sand, like a hen, and when doing so it often turns completely on its back, kicking the air violently with its feet. Cassowaries are in all respects more lively birds than emus; they often playfully chase each other, and have a

habit of running round in a circular direction, apparently simply for amusement.

About the southernmost limit of their range cassowaries and emus inhabit the same districts; but they never actually intermingle; and, advancing northward, the cassowary will be found to rapidly supplant the emu, which is not found, except as a straggler, in the extreme north of the continent.

Unless prompt measures are taken for its protection, the cassowary will soon be an extinct bird on the Australian continent. The extraordinary crest, or helmet, is a curiosity much sought for by some persons; and the bird is greatly harassed by stock-riders, shepherds, and other people of similar classes, who shoot them at long range with rifles; and, as no discretion regarding season or condition is observed and the bird is far from prolific, its numbers have already been greatly reduced.

Beyond the Mitchell River no striking change in the scenery of the country was observed, and of necessity we were compelled to turn homeward, the route being taken on a line which ran much nearer to the sea-coast than the one we had been following.

At the farthest point we reached the country was well stocked with game, consisting of several species of the kangaroo tribe and birds without number, including bustards. Apparently there is but one species of bustard (*Eupodotis australis*) in Australia; but the birds of this kind inhabiting the north are a much deeper brown in colour than those found in the south. The two kinds seem to be what some writers term "local varieties"; and it can scarcely be denied that locality has some effect in moderating species. The subject seems to need further study. It is not certain that the Australian bustard is a distinct species. It at least greatly resembles the *Eupodotis edwardsi* of India and other parts of Asia.

During the latter part of our journey home we had to subsist almost entirely on the flesh of wallaby and birds and a few fish which we caught in the billabongs and water-holes. It may be worth noting that as the waters

of the rivers dry up or evaporate, the fish either collect in the deep holes or retire to the lower reaches of the river, where they have sufficient water for their needs. They must be possessed of unerring instinct, if not positive knowledge, for those holes to which they retire have water in them all the year round. A few fish, however, perish; for in most of the holes a few are found imprisoned—individuals which appear to have delayed their retreat too long—but the numbers which so perish are so small as scarcely to be worth notice. For instance, in a pretty big hole I have seen five or six bream imprisoned, which may have had the good fortune to exist in the muddy slush (it could scarcely be called water) until a fall of rain gave them a fresh supply of their native element. On the other hand, in holes which had a good depth of water, and were probably permanently wet, the fish are sometimes crowded together in great numbers. If the natives find such collections they capture the whole in their hand-nets.

The natives did not appear to be so numerous along the coast (at a distance inland of twenty or thirty miles) as they are further inland; but we met a few small tribes of them, with two of which we held friendly intercourse, and purchased some warren-roots, and other articles from them; for, of course, we did not help ourselves from the numerous warren grounds we passed. Nothing could justify a robbery of these poor people, except the last necessity of the robber.

Nothing of interest occurred on the last days of this ramble; and the country can only be described as the most mountainous I have seen in Australia. Several of the summits exceed three thousand feet in height, and one, Bellenden Ker, exceeds five thousand. They are all typical Australian heights, most of them flat-topped and cliff-faced; and on all those is far less forest-growth than would be found upon similar hills in any other parts of the world.

The most interesting feature of this region is the lovely fern-gullies. In ferns surely Australia can champion the whole earth! When in these gullies, we were completely

buried, man and horse, in the fern-growth ; and the beauty and delicacy of many of the fronds is beyond description.

Although Port Denison was our ultimate destination, we turned into Cardwell on the 14th of June for a good rest before finishing our journey, and here I must conclude the chapter.

CHAPTER XX

THE NATIVE BLACKFELLOW

TAKING up the books of the early navigators we find the black of the land called indifferently "the native" or "the aborigine," and his mental and moral qualities are generally painted in colour a good deal blacker than his skin. Colloquially, he is known as "a blackfellow" on the east, and "a blackboy" on the west side of the continent; and so much has been written about him, that it may be thought that I could better utilise the space than by adding my quota to his description. My object is rather to correct errors concerning the native Australian than to paint an original portrait of him; yet I think there is still something that is new to be recorded on the subject. The extent to which writers contradict each other when writing of the blackfellow is sufficient proof that they have very little first-hand knowledge of him; and even eminent navigators and explorers have too often substituted what they thought for what they ought to have known.

The Australian black has been, by a majority of writers, described as the most degraded of savages. He is a savage, but is not, by many degrees, the most degraded of savages; on the contrary, he is remarkably intelligent, and quite as cleanly and well-behaved as the drunken sots who may be seen at some of our low drinking-dens, "shouting," and "lambing down." He has many vices; but, in the face of frail humanity, of all races is it just to dwell on the failings of a poor child of the wild, who has not had thrust upon him, as the white has, the training and traditions of a thousand generations of civilisation—not

thrust upon him, at any rate, with the fostering hand of love, though the attempt to do it with the iron fist of policy may have been made, with a selfish aim in view—*i.e.*, to keep in control what is an acknowledged trouble, and possible danger.

So much I will say; but I am glad to acknowledge that on the whole, especially of late years, my countrymen have treated the blackfellow with kindness and consideration; and many just rules and regulations have been made by Colonial Legislators for his protection. There are no thinking men in Australia, and few men of any class, who would now tolerate the sight of the last miserable remnant of native life committed to a small boat; and, prostrated with sea-sickness, rowed away to some wretched isle of a few acres in extent to die out of a broken heart—executed by slow torture: that is the blunt truth of it. Such was the fate of the last half-dozen aborigines of Tasmania. But the age of such stupid, clumsy cruelty has passed away for ever, and I can boast that my countrymen have never subjected the blackfellow to such injustice as the American "Red-men" have suffered. Yet past generations of Australians have much to answer for. My happiness is to know that the present generation will endorse all that I can truthfully say in favour of the doomed native. For doomed he is by the immutable laws of progress, which knowledge and science may help on to the coming and ameliorate to the going, but cannot stop or alter. The Australian negro, unlike his African brother, is for some inscrutable purpose of nature barred from the acceptance of civilisation and its binding rules, and therefore not even the hand of love can save him from the inevitable fate which always overtakes a people unable to move forwards. Like a stagnant pool which has no feeder, the native race of Australia must dry up.

It is stated by many writers that there are two distinct races of aborigines in Australia. It may be so, but I have never been able to perceive any difference in the blacks but that which arises out of the accidents of locality and circumstances. For instance, the blacks of the northern

part of the continent, where the climate is more benignant, and game and food of all sorts more abundant, are a much finer set of men than those of the south, where the necessaries of life are more difficult to obtain. The food question is really the question of human life; and this is proved not only by the quality of the blackfellow, but also by his numbers, which are, I should think, quite ten-fold more numerous in the north than in the arid parched deserts of the south. In the north also the native is a fine upright and muscular man, in the south he is generally a puny creature with thin lanky limbs. In the north he is seldom under five feet four or five inches in height, and is often five feet ten, or even more; in the south, men who have ceased to grow, and are therefore fully developed are often not more than four feet five or six, and in the districts about King George's Sound and Swan River, five feet four inches is a good average height. In general intelligence the Australian black is entitled to take a high place. Those accounts which represent him as sunken in irretrievable sloth and degradation are not to be relied on. He is, in all parts of the country, acute, intelligent, and, on the spur of necessity, remarkably energetic and resourceful. Treachery and ingratitude are rare vices with him, so rare that I cannot recollect, at this moment, an instance of betrayal of trust on his part.

He has certainly some very shocking vices. He is extremely brutal to his women, and though he is sometimes given to jealous emotions, he has no sense of virtue in regard to those poor creatures, who are always his slaves. It is not an unusual thing for him to sell his wife for a little tobacco, or a similar paltry consideration; and the unfortunate woman is beaten unmercifully at the caprice of her lord. She never wilfully gives him cause of complaint, but any little accident, such as the breaking of his pipe, or the loss of any of his savage weapons or implements of the chase, is most surely punished with a murderous assault, in which it is quite likely the ruffian husband will break some of her bones. This despiteful use of woman is one of the worst traits of the Australian

black's disposition. Other prevalent vices are the crimes of infanticide, and the murder of the aged, cruelties to which the blackfellow is sometimes driven by paucity of food, not, I think, by a murderous disposition. While the poor old people can toddle after the tribe they are permitted to do so, and some fragments of food may be thrown to them, but when, worn out with age and semi-starvation, they can no longer keep up with the young and active savages, they are left to their fate. Young children, too, are left to perish in the desert. Sometimes the mother's love for her little one induces her to linger behind to care for the child her husband has ordained to die. Then fearful is the beating she receives, and in such cases the savage man may brain the infant with his waddy, but as a rule blood is not actually shed. The black avoids witnessing the death of his victims, and sometimes he evinces no small affection for his offspring. The black mother is invariably a good parent, and she has a most pathetic custom of carrying about with her the bones of a deceased child. These she often puts together with a rapidity and correctness that would not shame a professor of anatomy, and when the little skeleton is set up, she will talk mother's loving nonsense to it by the hour at a stretch.

In his relationship with the white man, the Australian black has often done splendid service as friend and servant. He has been faithful and true in the hour of dire peril ; and to his local knowledge and ability as a resourceful bushman some of our exploring expeditions have been more beholden than they have acknowledged.

It is very difficult to obtain information concerning the past history of the aborigines. In my opinion, there is but one race of them ; the so-called tribes are probably family parties, more or less individually related to each other. These parties or tribes consist of from twenty to eighty persons each, women and children included, the latter rarely exceeding an eighth of the whole ; and a tribe has possession of a certain extent of territory, which is never encroached on by the neighbouring tribes without

an immediate quarrel ensuing. Such a thing as an accidental trespass is never admitted. The consequence is, that tribes which are far removed from one another have no intercourse; and yet language and customs do not differ so much as might be expected under such circumstances. There is a marked difference in this respect between the natives of the north and those of the east and south; and the former use many Malay words, or words which have a Malay base, and this, I think, is one reason why they have been supposed by some writers to be of Malay origin. But there is no universal language in any part of Australia, and languages often differ most markedly amongst tribes living in immediate proximity to each other. The inhabitants of the north have from time immemorial had much intercourse with Malays and other Asiatics—hence the importation of foreign words, customs, and, in some degree I daresay, foreign blood; but there is not sufficient evidence to justify the positive assertion, so often made, that there are two distinct races of aborigines in Australia.

None of the native blacks, in any region of the continent, are prolific. Few of the women have more than three or four children, and of these more than half perish in infancy. Many are born dead as the outcome of brutality on the part of men anxious not to be burdened with a large family. The woman carries one child on her back; if she again becomes a mother before this child is capable of taking care of itself, the father usually insists on the abandonment of the baby.

In some tribes the young black has to undergo torture before he is admitted to the privileges of manhood, in others he has only to distinguish himself by skill in hunting or bravery in war, in others again skill and daring in wife-snatching is the test of manhood.

The wife is generally obtained by theft, and often a great wife-stealer will obtain many women in this way, some of whom he will sell to men of his tribe: for though a man to win a name for bravery and cunning must steal at least one wife, he may purchase others. The wife is

usually stolen from a tribe to which the robber does not belong. He rarely steals from a tribe with which his own is at enmity, and sometimes there is connivance on the part of the girl's friends. But the *modus operandi* is always the same. The robber steals into the territory of a neighbouring tribe, and, having marked the girl he wishes for, he awaits an opportunity of surprising her, and then, springing suddenly on her, with one brutal blow he knocks her senseless, and throwing the inanimate body across his shoulder, runs in all haste for his own territory. But the affair does not end here. The girl's friends make a complaint, for they always seem to know what has become of her. This complaint is taken up by the tribe against which the outrage was committed, and certain proceedings on the part of the robber's tribe are the results of a formal complaint. These proceedings are commonly stated by the old writers on the subject to have been invariably hostile; but I suspect on very good evidence that what followed was more of a farce than a serious business. At any rate, the culprit was required to stand a trial, which took place on the border ground of the territory of the two tribes concerned. The headmen of each tribe, generally about a dozen or twenty in number, assembled at the appointed place with the tribal chiefs and the culprit. No other persons were allowed to be present. All were fully armed, except the robber, and ornamented with war-paint of red or white colour, and as a preliminary, there was a great deal of gasconade and flourishing of weapons, the object of both sides being to show what very fine warlike fellows they were.

The actual trial began by the stolen girl's male relatives placing themselves in front of the robber at the distance of about thirty yards, each man being armed with three spears and a wommerah or throwing-stick, the offender being allowed no weapon except his ellyman, or long, narrow, parrying-shield. Each of the offended tribesmen hurled his three spears at the wife-stealer, who, of course, easily parried them. There is not a native in Australia

who fears a spear hurled at his front, so quick of eye are they all that they can avoid a thrown missile with perfect ease. This part of the trial was certainly a farce. The second part may also have been so, though it had a more formidable appearance. It consisted of a personal duel with waddies or clubs between the nearest relative of the girl and her abductor. The latter had to bear the first blow, and, strange to say, it never seemed to fell him, far less to have fatal results. Having borne the thwack, he straightened himself up and prepared in turn to administer a blow on the hair-matted cobbera or head of his opponent, who was compelled to stoop to receive the crushing blow. And so the game went on, knock after knock being alternately administered until one of the combatants was floored. The victor was greeted with acclamations, both parties yelled their exultation at the lively entertainment, and the day's sport terminated with a grand combined corroboree, at which the full strength of each tribe (including the dusky beauties) were present.

How matters terminated if the wife-stealer were killed or defeated I know not, for I could never learn of a case in which he was defeated, a sufficient proof, it seems to me, that the whole proceeding was, like many of the solemn ceremonies of civilised procedure, a formal farce. I have written the account of this quaint trial in the past tense, for wife-stealing and many other old native habits and customs seem to have died out, or nearly so, within the past few years. This may be chiefly owing to the fact that the native blacks are thinning out rapidly, and many of the tribes have no longer neighbours to rob of their daughters.

The woman is the absolute property of the man. According to native law, or rather custom, he may beat, ill-use, or kill her at his pleasure. She is always his hard-worked slave, and must submit herself to any man her husband chooses to lend or sell her to. Her father may give her, as maid or widow, to whom he pleases. If the father is dead, her brother, and after him the nearest male relative becomes her owner, with plenary powers to sell, beat, or

slay her. An awful fact to state, but not one whit exaggerated. Of course, colonial law affords her some protection—in theory. Of late years I believe the natives are more closely watched, and perhaps, on the whole, the native woman has not so hard a time of it as she had formerly; but I fear it must be stated that her best protection lies in the fact that she is too valuable a slave to her husband to be rashly destroyed.

Once married or owned, the greatest part of her time is taken up in providing for her husband and children if she has any; and hard as her lot invariably is, she is probably better off when married than when single. Natural affection does sometimes assert itself even among savages, and though the Australian man is too often a brute, he does sometimes show a marked affection for his wife and children. At any rate, the married woman has only to provide for the wants of her husband and children, while the young unmarried girl is the slave of all her male relations, and suffers blows and other ill-usage from every member of her family, besides having to toil incessantly for their benefit. She it is who digs the warren patch, and sees to the weeding and watering of the roots; and she it is who spends every moment which can be spared from her other occupations in hunting the snakes from their holes, and climbing the trees in search of the opossum, and pursuing other small game for the provision of the family which claims her as its property.

Regarding the personal appearance of the aboriginal woman, she is almost invariably described as one of the ugliest of her sex. That is scarcely the truth, though it is true that she is not a beauty. She is usually undersized and shrivelled in flesh from semi-starvation and excess of toil, and her features are those of a type usually found amongst the uneducated and down-trodden; yet they are not lacking in intelligent expression; indeed, this expression is common to all the Australian blacks, in spite of their misery and degradation. Whatever the woman is told to do she does instantly, obeying orders with the alacrity of a well-drilled soldier. She has, in fact, no will of her own.

She is extremely susceptible to kindness, and, as is recorded of the women of most savage people, very apt to entertain a dog-like affection and fidelity for those white men who form connections with them; and in spite of the lack of personal attractions in the native women, their white husbands generally become strongly attached to them, and rarely forsake them. Unions between white men and native women are by no means rare among such classes as shepherds, stock-riders, and men of the lower classes generally, who live much on the back-runs, where white women are seldom or never seen.

The food of the native black consists of everything swallowable which he can lay hands on. It has been asserted that he eats the most revolting objects, such as slugs, worms, and beetles. Well, I have seen boiled snails placed for sale in a shop at Bristol, and heard that it was a common dish in that part of England. It is true that the black esteems certain large grubs a great dainty, and habitually eats large numbers of snakes. I have not seen him eat worms or beetles, but I have seen several persons of no mean station in English society eat cheese which was alive with maggots, to say nothing of their fondness for stinking game. Tastes are certainly variable, and the liking of the Australian black for grubs and snakes is no sufficient evidence of his being a peculiarly disgusting feeder. The assertion that he eats his offensive tit-bits raw is not, I think, correct. My experience is that, with few exceptions, he cooks his food. Snakes and grubs are grilled, and so are all kinds of fish and game. Shell-fish and a few other dainties he prefers to eat raw; and most civilised men think an oyster spoiled if cooked. Again I say that tastes are relative. Hodge, who sits under a hedge to eat his bread and bacon, is a vulgar creature in the eyes of some fantastical persons—the great landscape painter generally esteems him a very picturesque figure.

The bulk of the native blackfellow's food is of a similar character to that which all hunters esteem and eat with gusto. He contrives to procure fish and game of all sorts, and where these abound he is a well-fed and

well-developed man, strong, lithe, and of great powers of endurance. I notice some of his most ingenious methods of capturing the animals on which he loves to feed; for the man pursues the larger game and that which is most difficult to secure, leaving to the woman the task of collecting the smaller fry mentioned above.

Kangaroo and wallaby are captured in several ways, the two most frequently resorted to being the chase with dogs and the pitfall. In both the game is driven into a crowd with the aid of the semi-tame dingo dogs. In the chase the men surround the troop of frightened kangaroos and spear them as they attempt to escape. If a herd of sixty or seventy are driven together, the hunters think they have had very good luck if they succeed in killing eight or ten of that number.

The pitfall is a short trench ten and sometimes thirty or forty yards long and nine or ten feet deep. In section it is V-shaped, and the kangaroos of whatever size that fall into the trenches, being unable to obtain a purchase for their paws, cannot leap out, and are most effectually trapped. A line of pitfalls is made across the country, and they are generally placed in echelon, so that those kangaroos which escape or try to avoid the first pits they come to have still many chances against them. This pitfall method is the best way of hunting such game as kangaroos and wallabies, as the animals over a wide area of country are driven together and forced to fly, by men and dogs, in the desired direction. Though, of course, the majority escape, many animals are sure to be taken; and it is not unusual for an emu or two to be thus captured, for the wedge-shaped pit is admirably adapted for holding fast the unfortunate creatures that slip into them; and the skill evinced by the blackfellows in the construction of these pits, and in the use of the wommera, or throwing-stick, and of the boomerang, show conclusively the high order of his natural intelligence, for all these inventions are mechanical contrivances of the highest ingenuity. It is vain to argue that they are chance discoveries—all human inventions have taken their beginnings in chance. It is only superior

intelligences who have taken advantage of chance discoveries, and turned them into lasting benefits to their fellows.

In the art of fishing the native black is very skilful, and he uses a great variety of contrivances for the capture of marine and fluvial creatures. Sea-going canoes have never, to my knowledge, been in use among the aborigines; but in some parts of the country they use rafts, which enable them to cross straits and reach islands that are at no great distance from the coast. From those rafts they occasionally fish; but the usual method is to stand on the sea-shore, and with hook and line capture the littoral species of fish. Formerly the blackfellow made his own hooks from pieces of bone; but for a long time past most of the tribes, except those far in the interior of the country, have contrived to become possessed of the wire-hooks of civilised man. But the favourite way of fishing is by means of nets. In the manufacture of nets the aborigines are exceedingly skilful, and some of those made for the capture of wildfowl, etc., are of very great size; long enough to go right across a small river, and high enough, when elevated on poles, to intercept the flying ducks and other birds which it is the object of the netter to capture. The nets are put into position at the dusk of evening, and the birds become entangled in them as they fly home to roost.

The twine of which the nets are made is neatly spun by the women from a kind of flax which grows in marshes and near rivers in nearly all parts of the country; and I have seen nets made of rushes and grasses. Although the poor women have not the advantages of our tools and methods, the workmanship of their nets is very beautiful, and superior to ours.

The nets used for the capture of fish are mostly hand-nets. These are short lengths of net fastened between two sticks, and the fishers may either enter the water in numbers and join hands, forming a large circle in which the fish are enclosed and driven into shallow water, where they are easily captured, or the men may work singly, in

which case the full activity of the naked black is brought into play. He chases the fish in the water so quickly and skilfully that he often fairly runs them down before clasping them in his clap-net, for clap-net is the proper designation of his strange implement.

The weapons of the Australian aborigines are more numerous than those of most savage people; but he has never used one most important weapon of the chase and warfare which has been in use at some period and in some form (long or cross) amongst almost every tribe and nation on earth, that is, the bow. For hunting, the Australian black relies mostly on the spear and the boomerang, but the latter weapon is not in universal use. The northern tribes, or at any rate most of them, are unacquainted with it, a circumstance which shows how limited is the communication between the tribes of this people. The spear is generally hurled with the aid of a throwing-stick called a wommera. This remarkable and most ingenious contrivance is about a yard long. It is very narrow at one end, but gradually increases in width until it is two inches wide, or perhaps wider, at the butt-end, which is held in the hand. At the narrow end there is a projection or nut, against which the butt of the spear is pressed, with the length of the wommera parallel to the shaft of the spear and close to it. The thrower holds the wommera at the broad end, with the fingers lightly clasping the spear. Then, throwing the arm as far back as he can, he launches the spear forward with much greater force than he could if he attempted to throw it without the aid of the wommera. Some authorities say that the thrower bends the spear against the nut of the wommera, so as to give the weapon a spring when it is hurled. I have not observed this myself, and no black-fellow whom I have consulted knew of such a contrivance for increasing the force of the flying spear. With the aid of a wommera the spear can be thrown a distance of about seventy yards, which is quite twenty yards further than it can be hurled by hand alone.

The marksmanship of the black in spear-throwing is not

very notable. As with civilised men, the skill of individuals among the blacks in all their exercises and crafts differs considerably. Some men throw the spear with much greater sureness of aim than others. A good spearman will hit a mark the size of a man, or a large kangaroo, about once in four or five throws at a distance of fifty yards. When hunting each man carries a bundle of about a dozen spears, which he places on the ground at his feet. As the game is driven past him, he throws spear after spear as fast as he can pick them up, and it is hard luck for him if he does not bring down at least one of the flying animals, which are compelled to pass him at a distance, at most, of twenty-five or thirty yards, as the whole tribe will be standing in a line before the beaters, who are generally the women and children, with the dogs and a few men to direct their movements.

In war the spear is used mostly in hand to hand combats; if thrown it is at the back of an enemy, or in surprises. For if they see the spear coming, all the natives can avoid it with perfect ease, so keen of sight and agile of body are they.

The wommera is pretty generally used all over the continent, only a few tribes being unacquainted with its use. But the now extinct inhabitants of Tasmania never used it.

The boomerang, as I have already stated, is not by any means a universally known weapon on the Australian continent. It is used more frequently in the east and south than in other parts of the country. The shape of the weapon is familiar to most people. It is a flat piece of wood, about thirty inches long, of the shape of the segment of a circle, with one end straightened to form a handle. It is thrown at an object on the arc of a circle, and revolves and gyrates in the air in an extraordinary way. On striking an object, or the ground, it rebounds to within a few yards of the feet of the thrower. Hurled among a flock of birds, it generally knocks down several. It is not so successful when thrown at objects on the ground; but it is a nasty weapon to encounter in

close fight. In some tribes the boomerang is called a kiley.

Formerly the natives used stone axes, called "tomahawks" by the early explorers; but this is an American Red Indian word. The natives, however, have generally adopted, and for many years past they have been well supplied with, steel hatchets and choppers, which have quite supplanted the stone implement.

The waddy is a club about a yard long, and much heavier at one end than the other. It is used in single combat, and for a variety of purposes, as the killing of snakes and larger animals which have been run down or captured in pitfalls, and, I regret to record, for woman-beating.

Another very formidable weapon of the blackfellow is shaped like a one-armed pick-axe. It is very sharp-pointed, of handy size and weight, and at close quarters is so good a weapon that, armed with one and an ellyman or shield, a blackfellow has been known to maintain a stubborn hand to hand combat with a mounted police officer, who was unable, though a very experienced swordsman, to cut him down. Finally the black drove his liangle through the nose of his opponent's horse, and leaving it there, made good his escape. This weapon is generally called a liangle, but I have some doubt if this is the original native name for it. It has a suspiciously European sound, which makes one think that, like "tomahawk," it may be a word adopted by the Australian blacks.

The intelligence and ingenuity shown by the native in the making of several of his weapons, particularly the boomerang and the wommera, is sufficient to show that the charge, so often rashly made against him, of being an utterly forsaken and unimprovable savage cannot be maintained.

Concerning his personal courage, it may be said to be of a high order. When Captain Cook attempted to land on a spot on the coast of New South Wales, two men, one of whom was a mere youth, fetched a bundle of spears

from the bush, and, standing fully exposed on the rocks, defied the landing of two boats' crews. What praise and reward would be given to two European soldiers who showed such determined bravery! Time after time have the natives displayed a bravery as firm as that of their two heroic ancestors; and even after they had become aware of the deadly nature of firearms, they often showed an utter fearlessness in attacking police and soldiers. I do not pose as the apologist of the native of Australia; but it is a fact which cannot be contradicted, that the first settlers of the continent behaved with great brutality to the native tribes, often shooting them down without the slightest provocation—in a panic of unreasoning fear, it would seem. This very naturally led to reprisals, which unfortunately often fell upon innocent heads, and a frightful state of revengeful murder was the consequence, in which the white savage showed that he could be quite as cruel and unrelenting as the black one. Happily this state of things has passed away for ever, and there is not in any other part of the world a large tract of land in which the aboriginal population gives the usurper so little trouble as in Australia.

Generally, the blackfellow goes perfectly nude. Cloaks, however, are occasionally worn by both sexes, those of the men completely covering the back, while those of the women come down to the knee, and not infrequently to the ankle. The women also wear aprons, these and the cloaks being made of kangaroo and wallaby skins; but some individuals show great taste in the making of these articles of dress; and I have seen very handsome cloaks and aprons made of opossum and other small mammal skins, and sometimes of the feathered skins of emus. Some are even ornamented with the brightly coloured feathers of parrots, cockatoos, and small birds. The native does not, as a rule, wear a waist-cloth; but I have seen such a covering used by women, though the females generally display but little sense of shame, and when at work, or carrying heavy articles, go as naked as the men.

Head ornaments are sometimes used. Those which

are most characteristically aboriginal are shark's teeth, and those of kangaroos and other terrestrial animals. Bits of coloured coral are also used for this purpose, and individual instances have come under my notice of a great variety of natural objects being utilised for hair ornamentation, such as small, vividly coloured shells, fruit-stones, and the tips of animals tails and feathers. All these are firmly glued to the hair with a kind of bitumen, obtained in some instances, in the inland marshes.

A very curious article is the hunger-belt. I have never heard of any such contrivance being used among the savages of other countries; and its invention is another proof of the unusual intelligence of the Australian black. It is usually made of the skin of an animal such as the wallaby or kangaroo, and is frequently highly ornamented. It is tied tightly round the stomach when the savage has to go on short commons, and the more hungry he becomes the tighter he braces his belt; and this compression of the empty stomach is said to afford him much relief from the pangs of starvation.

Many of the old fashions and beliefs, however, have died out. The blackfellow and his wife now ornament themselves with the tawdry finery of the colonist, which is always to be had for the asking from the squatter's wife and daughters. The black is no longer shot on presenting himself at the lonely station—there is rather a tendency to make a pet of him; and instead of putting on his hunger-belt in times of scarcity, he betakes himself to the nearest station, where he is always sure of obtaining food. Indeed, many tribes reside habitually on the outskirts of the stations, where they live on the entrails and offal of the slaughtered sheep and cattle, and such broken victuals as the "hands" and the squatter's wife is sure to give them willingly. In addition to this, their claim to assistance, and to be considered something better than wild beasts, is acknowledged in a very different way by modern colonial governments from that which distinguished, and too often disgraced, the regimes of the first governors. The blackfellow is now, to some extent at least, cared for; and

there are several mission stations at which, if he cares to submit to the control, he can learn to become a civilised man. Many excellent people in all the colonies are anxiously devoting much of their time and means to redeeming the man of the soil from the state of forlornness and degradation in which he has lived since apparently the time of his evolution. These stations, however, have not met with the success which they deserved. Few of the natives can tolerate restraint for any great length of time. Many of them will serve the whites faithfully and well for a few months, then they must have a jaunt in the desert, visit the scenes of their old exploits and past joys, and witness and take part once more in the wild pleasure of the ever, to the aboriginal mind, delightful representation of the corroboree.

The corroboree I have already described. It is not a dance, as the old travellers invariably called it, but a dramatic representation—a play, and often a very complicated and intelligent play, though it is but rarely that the white man is qualified to understand it thoroughly. Here it would take too much space to fully describe one of the most elaborate corroborees. It must suffice to state that there is always a plot, which is often worked out with great details and many interludes, and also with attempts at "effect" which are quite equal to the "limelight" and bluefire of the ordinary European or colonial theatre. For instance, at a very interesting corroboree I witnessed, a very pretty effect was made, and the native spectators much impressed, by the throwing of flights of boomerangs with some lighted substances attached to the ends, which burnt brightly as they whirled through the air.

Some of the errors which have arisen concerning the corroboree are doubtless due to the facts that dancing, or a quick action resembling it, always forms a considerable part of the representation, and also to the circumstance that the corroborees witnessed by white men are specially organised for their pleasure, and are not genuine representations such as the natives give on ceremonial occasions; for it is on ceremonial occasions that the

greatest and most elaborate corroboree plays are given. On these latter occasions the blackfellow has a dislike to the presence of the white man, and it is only such whites as have thoroughly won his confidence that are permitted to be present at a grand corroboree.

I am not sure whether the corroboree has a religious signification or not, or whether the native has a religion of any kind. He has certain superstitions, but they do not seem to be of a religious nature. He believes in a spirit known by a great many different names in various parts of the continent. This spirit, which hides in dark forests and scrubs, is sometimes represented as being good, sometimes bad, or perhaps there are two distinct spirits, one evil the other good. There is great difficulty in ascertaining a native's religious beliefs, because he thinks it is evil and will bring bad luck upon him to discuss the matter with a white man. To avoid giving offence he often misleads an inquirer, acknowledging beliefs which are really no part of his religion, if he has one. All I can state with certainty on this subject is that he believes that there is a spirit which has the power to do him great harm, and must be propitiated by careful conduct and the avoidance of offence rather than by material gifts. He believes also in another spirit of the reverse disposition to this evil being, who also must be served by careful avoidance of every thought or action which may pain or grieve it. This, after all, is just the Christian's conception of the Supreme Being.

In some parts of South Australia it is the custom to deprive the females of the first joint of the little finger of the left hand, which is cut off during the period of infancy. I do not know if this custom, and that of knocking out a front tooth, which is practised by most of the tribes, is a religious rite. I have not been able to satisfactorily ascertain the real significance of these customs.

Everybody has heard of the marvellous facility with which the Australian black will follow a track. No enemy can avoid him, no creature escape his searching eye. He will track a mouse or a small snake for miles, and doubtless,

after hours of patient toil, capture it. As a test, I have flung a sixpenny-bit as far as I could into the densest scrub I could find, into which a white man could not penetrate without cutting a way, and in which he could certainly never find so small a coin as that named; yet a blackfellow would make straight for the spot where the sixpence fell, and in a few moments come back with it in his hand. I have purposely left a shilling on the road, hiding it under a stone. A blackfellow followed my mundowa, or track, five miles along the road, instantly detected that I had moved a stone out of its place, lifted it, and triumphantly held up the shilling. I could multiply such instances by the dozen. The blacks never lose any of their own property. If by chance they drop anything, no matter how small, they go back the moment they miss it, and never fail to recover it. The black trackers attached to the police have rendered great services by their marvellous powers of tracing criminals, and they serve as a standing menace and preventive to offenders of their own race, who know that they will assuredly be tracked down if they offend against the laws of the white man.

Of the general habits and customs of the blacks of Australia I can take but a cursory glance. As I have said, they often go entirely without clothing, and in no circumstances wear more than a scanty cloak, and perhaps a rag round the waist. Often they are content to live in the open, without dwelling of any kind, in cold weather erecting a lean-to of hurdles to shelter them from the wind. Their huts, called gunyas, are very rude attempts at house-building; in fact, the black does not display a similar ingenuity in the erection of his dwelling to that which he shows in the construction of his weapons and implements. The property of a blackfellow, of which he thinks as much as any great landed proprietor can do of his estate, seldom consists of more articles than his gin, or wife, can carry on her back. These are nets and spare twine, made by the patient women, a tobacco pipe or two, and a small supply of tobacco. Probably he treasures up a few

bits of broken pipe, the remains of former cherished possessions; and other useless articles will be a few pieces of coloured rag and paper. A box of matches is a valuable possession to him, which he much covets. Lines and fish-hooks will form part of his equipment; the hooks will probably be of factory make. If he has to rely on himself for a supply of these necessary articles, they will be neatly, if not beautifully, made out of bone or shell. If he has a spare hunger-belt, it may be made of fine plaited twine, which his gin has spun from the fur of an opossum or native cat. He nearly always has a pouch attached to the hunger-belt, and perhaps another secured by twine round the upper part of his right arm. In one of these pouches he carries his supply of tobacco, which he is seldom without, for so passionately fond of the weed are all natives, even the women and children, that they will travel several hundred miles to beg or barter for a little from the stock-riders and shepherds. These few articles, with his weapons, a knife, and perhaps a few pins and needles obtained from a squatter's wife, generally represent the entire possessions of an average blackfellow. He may have, in addition, a few bits of rubbish picked from the dust-heap of some station, and which, though utterly useless, he treasures as a miser does his gold. If his gin has a few bits of left-off finery, or an old gown, happy woman is she.

Everything the blackfellow possesses is carried in a net-bag, a handy and light way of packing his goods. Even the baby is suspended to the mother's back in a net; and so well spun is the twine of which these nets are made that they last for years, and I have proved that the twine itself is quite twice as strong under a weight test as the best of ours. It is plaited, not twisted.

In general deportment the blackfellow is rather grave, but he is not destitute of a sense of humour, can be merry on occasion, and often laughs heartily. Provoked, he is vindictive; but well used he is generally thankful, and never forgets a kindness. The worst feature of his disposition is his cruelty to his woman, and the low esteem

in which he holds her. But I think this trait is the outcome of custom rather than of natural ferocity of heart. A black would be despised by his fellows if he failed promptly to punish carelessness or laxity on the part of his wife. Of her morals he has no care. She must not go aside of her own will; but at her husband's command she is compelled to perform the offices of a wife to any man he chooses to indicate. It is a common practice among the natives to lend their wives to each other. It is only rarely that a native has more than one wife; but the assertion that none but the chiefs may have more than two at the same time, is not correct among any tribes that I have been amongst. The tribes differ much in their habits and customs, and among some monogamy may be enforced, but I strongly doubt if it is so.

The chiefs do not seem to have so much power as is usual among uncivilised peoples. All important acts and proceedings are settled at meetings of the men of the tribe —that is, of all who are acknowledged to have entered fully on the manhood state. The initiation into the privileges and rights of manhood is performed in secret, and takes a considerable time. I do not know exactly to what rites the youth is subjected, but he has to undergo a considerable amount of torture without complaint or breakdown. The white man is not allowed to witness the ceremonies or the trials of the initiation, and the black will not converse about them, but puts off the inquisitive inquirer with concocted tales.

The chief has a few privileges, and he regulates and commands the migrations of the tribe to the various districts of their hunting grounds. He also commands in war, but cannot make war or peace without the concurrence of the tribe; neither has he control over any man's right of free action, or over his life or property, nor could I ever perceive that he is treated with any extraordinary amount of respect.

The dead are disposed of in quite different ways in various parts of the country. In the north-west and some other parts of the north, and also in some portions

of the interior, the corpse is wrapped in cloaks and enclosed in a bundle of sticks, and placed on a platform high up in a tree; and the place where the tree stands is avoided by the tribe, and jealously guarded from approach by others. When the corpse begins to decay, it is often torn open by birds of prey, which feast on it; and these are not interfered with, but are permitted to consume the flesh of the deceased.

Very generally throughout South Australia, including parts of New South Wales and Western Australia, the dead are buried in a sitting posture in the middle of a large round hole, which may be as much as ten or twelve feet in diameter, though never very deep. The deceased's weapons, property, and some food, are placed beside him, and the whole buried under a heap of loose sand or soil. The grave is never afterwards visited. Women and children are disposed of with little ceremony. The special belongings of a gin (or wife) may be placed in the grave beside her. The bones of very young children are often cleaned of flesh, and carried about, as I have already remarked, by the mother, often in her net-bag, mixed up with the family belongings.

Cannibalism is quite unknown among the Australian blacks, which is remarkable, considering that in many parts of the continent there is sometimes such a paucity of food that the people subsist with difficulty.

CHAPTER XXI

THE GREAT BARRIER REEF

It will be remembered that the base from which I started on my longest ramble in Queensland was Bowen, Port Denison; and Bowen was the base from which I started to examine portions of the Great Barrier Reef.

Bowen, a small town when I was last there, is a semi-tropical looking place surrounded with hills—a sort of dead-alive fourth-rate township. The valley under the hills, in which most of the houses stand, is known colloquially as "sleepy hollow," and the name is expressive of the characteristics of the inhabitants. Everybody in Bowen speaks with a drawl, and walks as if suffering from sore feet; but it is true they have a warm climate to excuse their habitual lassitude. It is hot at Bowen and all along the coast to the northward, a beautiful, warm, clear, and intensely blue sky prevailing almost without a break all the year round.

A peculiarity of the coast in this neighbourhood, and for a long distance to the north, is the number of boulders on the strand, on the hills, and on the grassy slopes which often run down to the water's edge. These boulders are clearly water-worn, are often of huge size, and are sometimes piled up in huge masses of fantastic shape. The shore is sometimes covered with them, and they appear as shoals far out at sea. Many of great size are found on hill-tops, and smaller ones are scattered about all over the land in wild confusion. In some cases they spoil the landscape, giving it a ruined and untidy appearance; in others, especially where the masses are large or piled high up,

they are a decided enrichment of it. Often there are masses of rock which have the appearance of houses or castles; and double-peaked hills are found along this coast, as they are in most parts of Australia.

Inside the reef the shallowness of the water is indicated by the great variety of shades—grey, green, pearly, and red tints—which are reflected from its surface, the deep ultramarine outside in the offing appearing nearly black in contrast. The reef is indicated in various ways. Sometimes we see the long, low, white, sandy beach of a coral island with a line of dark vegetation and a few tall trees standing up from the bush below. Here and there are black, fearful-looking rocks, the rugged outlines of which tell how easily they could saw, cut, and crush the largest and stoutest of ships to minute fragments. Everywhere, or nearly so, the surging froth of breakers warn the navigator that death and destruction are waiting for victims.

Cruising about and over these reefs is desperately dangerous work even for small craft. How Cook escaped a fatal accident on this difficult coast is past finding out. His vessel bore a charmed life; or there is, indeed, a sweet little cherub sitting up aloft to guard the noble lives of the brave and the heroic. But the wondrously beautiful sights to be seen about the Great Barrier make the risk worth braving. It is only from a small boat that the most superb of these sights can be witnessed. One has to be near the surface of the water to see distinctly the objects that live and flourish in some of the depths below, and to note the marvellous display of colour which tints many of the fish and weeds.

Weeds I call them, but many of the submarine growths are arboreal in size and appearance—great trees with many coloured and many shaped leaves and fruits. Others are of a trailing growth, and of immense length. They often look weird in their undulatory creeping motion beneath the waves, especially when some uncouth monster is seen darting from amidst the umbrageous mystery beneath the floating leaves, or craftily trying to conceal itself amongst the interlaced tangle, which is impenetrable to the human

eye. Here are large sharks and fish of undistinguishable species, which, probably magnified by the water or the manner in which the light plays upon it, appear to be of enormous size—far larger than anything of the kind we ever see drawn ashore. Shoals of small fish, many thousands in number, are remarkable for the brilliancy of their colours, every conceivable tint being reflected strongly from their bright scales. With most of these fish the colours go with their lives, and in all it rapidly fades when they are taken from the water.

These reefs are a valuable nursery of fish. Hundreds of species here breed in peace; and their harbours of refuge, in which the destructive "steam trawl" will never be able to play havoc, are innumerable. The coral is an insurmountable obstacle to the use of any kind of trawl or drag-net; and the growth of marine plants also is so thick as to prevent ordinary fishing operations. But a considerable hook and line catch is made by local fishermen.

The forms of the coral are various, but nearly all of them exceedingly beautiful. Large trees of coral are numerous, and to the branches of some of these I have seen hundreds of shark's eggs attached. Flaked or mushroom-like corals are among the commonest shapes; and there are thousands of "brain-stones" lying about the upper parts of the reefs. Generally the coral is as white as snow, but sometimes it is much discoloured with parasitic growths, and much of it is dead, and reduced to a whitish sand. Fan-like masses of huge size, similar to those noticed at the Abrolhos on the other side of the continent, are very plentiful, and, as at that place, occasionally are heaped up into small islands or quays.

Probably in no part of the world can a finer display of sea-anemones be seen than on some of these reefs. Large patches of various colours form submarine gardens of the most magnificent appearance. Few or none of these *Anthozoa* seem to be recorded; and, in spite of great precaution, I did not succeed in keeping any of them alive for an appreciable length of time. They died wholesale

on being taken as far south as Sydney. The colours of these splendid creatures were mostly pinks, oranges, purples, and bright crimson, and the varieties were hundreds in number. Considering that the temperature of the sea a foot below the surface on the Barrier Reef does not differ so much as a degree from that of the water off the coast of New South Wales, it is singular that I could not keep reef *Anthozoa* alive at the latter place, especially as similar species obtained on the coast near the Harbour Heads, Port Jackson, flourished well in a small body of water. I suspect that it was the great atmospherical change of temperature which affected them.

In beauty of form, though not of tint, the reef anemones are perhaps eclipsed by the glass-sponges, which abound, especially at some considerable depth, on the outer face of the Barrier. In delicacy and intricacy of pattern these sponges excel the finest laces I have seen. Here I found the largest sea-fans and brain-corals known to me. All classes of *Cælenterates* and sponges are very numerous on the reef. The sponges are mostly small, and are found within the Barrier in water which does not often exceed one hundred feet in depth. Outside the reef there is as much as six hundred feet of water close to its face, and in some spots quite two thousand feet. This was the greatest depth I could sound, as I had no more line with me; but the chart shows that even the latter depth is exceeded in a few places, though the depth does not increase for a long distance to the eastward—an unusual circumstance, I think, as the water a few miles, or at any rate, a few hundred miles outside a coral reef is usually of abysmal depth. Abysmal depths, however, are not found in the immediate neighbourhood of Australia; and there seems to be evidence that the whole continent is based on a coral formation of vast extent, which indicates that it was, at a distant period, at least twice its present area in extent. If this is really so, the tiny coral-zoophyte is an even more wonderful land builder than it is universally known and admitted to be.

On and about the reef nearly every sea-bird and fish

found on the coasts of Australia finds a home; and a few are peculiar to it, of which the dugong (*Halicore dugong*) is the first that calls for notice. I say here that the Australian dugong is peculiar to the Great Barrier Reef. This may not be strictly correct, since I have heard of specimens being found on the north and north-west coasts, which are out of the reef region. But though stray specimens may have been captured in the named districts, I am quite sure that the reef is the real home of the dugong in Australian waters. In no other part of our territory has the dugong ever been a prevalent animal. There it formerly dwelt in large numbers, herds of them being sometimes seen which numbered hundreds.

The dugong, the head excepted, has the shape of a whale; and I consider it to be closely allied to the cetaceans, the greatest difference in habit being that it is a vegetarian and not an animal feeder. The head, and especially the muzzle, have a bull-dog like appearance—on a cursory view, at any rate; and the neck is better defined than it is in the whales, yet it is not well developed. The paddles or flippers are much larger, proportionally, than those of any whale; but the animal is a slow, inactive creature, of gentle disposition, and rather stationary habits. It seems, unless it has been much disturbed, to haunt one spot for many years, or to return to it very frequently. It is known, from harpoon heads which have been found buried in the flesh of some individuals, and from noted marks on others that it lives at least sixty years; and the probability, deduced from its slow growth and other circumstances, is that the duration of its life extends to a much longer period than this. A full-grown specimen is about eight feet long, and when in condition nearly seven in circumference. Larger animals than this are reported to have been captured, but I have not seen them.

Formerly dugongs were so fearless that they would often raise their heads above the surface of the sea to stare at men in a boat; but continual persecution has rendered them cautious, and the few that now remain on the reef

never show themselves. Once only have I had the pleasing experience of seeing a dugong raise its head above the water. This was off the coast abreast of that remarkable peak, Peter Botte, and at a distance of about twelve miles from the shore. The animal remained exposed to view about two minutes, but on the approach of the boat it quickly dived out of sight.

I have seen dugongs under the water on several occasions, while I was making investigations in diver's dress. It is remarkable that all sorts of fish, including sharks, are afraid of a man in a diver's dress, but dugongs are not. Frequently I have got so close to them that I expected to be able to touch them, but they would not permit this, swimming slowly away when I got close to them. In all their actions they are slow and deliberate; and though, judging from their conformation, one would expect that they could swim and turn in the water quite as actively as a whale can do, this does not seem to be the case. The flippers are powerfully formed, and so is the tail; yet the animal changes direction with a remarkably sluggish motion, and floats along rather than swims. It is certainly capable of moving faster, but, so far as I could discover, only does so in short spurts on rare occasions, as when it is frightened, or when the male is pursuing the female.

Dugongs do not seem to have any natural enemies. Sharks do not attack them, and dugongs show no fear of these ferocious creatures. I have seen thirty or forty sharks cruising about amidst a small herd of dugongs, but neither species of animal seemed to notice the other, or try to avoid each other.

The dugongs feed entirely on marine herbage, which they gather and masticate beneath the surface of the water, the jaws working with a peculiar motion, unlike that of a land animal. They usually feed in companies of about a dozen each, comprising animals of several ages and sizes. If it is true that they ever assembled in large herds of three, four, or five hundred head, that has long ceased to be the case. I have never seen as many as twenty

together; and though it is rare to meet with a solitary dugong, parties of no more than four or five in number are frequently met with, while at the present day a herd of fifteen or sixteen is a large one. The sexes are termed bulls and cows by the harpooners (mostly old whalers), and the young are calves, and all ages, sexes, and conditions have been captured, with the result that the "fishing," as it is called, is no longer profitable as a distinct calling, and the dugong is in danger of extinction in Australian waters. Fishermen now capture the few they accidentally meet with, the blubber of dugongs fetching a much higher price in the market than that of whales.

The dugong is full of blood and tenacious of life, but is of such a gentle and harmless disposition that it never makes the slightest resistance to its captors, and only devotes its energy to a fruitless effort to escape. Owing to its inactivity, it is captured with great ease; and its numbers are now so reduced that it is but seldom seen even by those whose interest it is to keep a watch for it.

The female dugong seems to never have more than one young one at a birth. This clings to her breast by means of its flippers, but depends mostly for support on those of the mother. She supports it with one flipper, except, I am told, at such times as she partially rises out of the water, when she clasps it with both. She never abandons her young one; and when pursued and obliged to exert herself to escape, she holds the calf with one flipper, and swims with one and her tail. Even thus handicapped she contrives to retreat faster than does the unhampered male.

I believe that dugongs ruminate. They remain quiescent for hours at a time, floating about eight or nine feet below the surface of the water, and not more than two or three from the bottom. Here they just move, like a water-logged cask, and no more; and a slight movement of the throat is perceptible; but whether this arises from the exertion of breathing, or from the action of chewing, I cannot state with certainty. I, however, strongly believe that it arises from the latter action. I

could never approach sufficiently near to the animal to convert conjecture into certainty. The breathing takes place very quietly; and the animal is far more submarine in habit than cetaceans in general. It can exist, without rising to the surface to breathe, for an hour—perhaps for a much longer period. When resting, from time to time a large bubble of air is emitted from the nostrils and rises to the surface of the sea. These bubbles often betray the whereabouts of the animal, for it loves to be in deep, quiet pools which are enclosed by rocks or coral formations, and consequently have calm surfaces. About every half-hour the dugong rises very slowly and quietly to the surface of the water, and remains with the muzzle exposed for three or four minutes; then just as slowly it sinks to its former position. When attacked or frightened it will hide amongst the heavy growth of weeds, or retire under shelving masses of coral, and I have witnessed them remaining in such positions for fully an hour without rising to breathe.

As the female dugong always haunts rocks or coral growths where there is a small cave, or perhaps a number of them, into which she can retire, I think it is likely that her young one is brought forth in such a shelter. She is coy in receiving the attentions of the male; and there are several "cows" under the care of each "bull." I do not know if the herds remain permanently together, but the pairing season is during the month of February, March, and April. It may commence a few weeks earlier, and continue a few weeks later, but it is at its height on the Australian reef during the named months. There do not seem to be any contests among the males, as there is with the seals and some other marine animals.

The dugong has never been seen to land, and never goes outside the Barrier Reef into deep water. It loves to lie in four or five fathoms of water, and is seldom found in depths that exceed ten fathoms. Its principal feeding-grounds are in four or five fathoms, and it keeps to calm water. From the little I have seen and heard of it in rough weather, I believe that it is almost helpless if it

happens to be caught in a surf, and I have heard of one being killed through being dashed against rocks by a tidal wave.

Most of these observations on the dugong having been made beneath the surface of the water, under unusual circumstances, I think they may be of some interest to my brother naturalists; and I may further mention that there is very great risk to the diver who descends on coral reefs or formations of any kind. Branches or sharp pieces of coral may cut the dress, or the air-tube or life-line may become entangled in the growths or around masses, in which case life must inevitably be lost. The utmost care and watchfulness is necessary to avoid such accidents as those mentioned, and the men in the boat must be thoroughly reliable, as the safety of the diver depends as much on their circumspection as on his own.

When I first made descents, I was often much alarmed at sharks and other dangerous marine creatures. I remember on one occasion a very large white shark suddenly loomed up near me, and came straight towards me. Before I could pull the signalling cord, however, the creature took fright, and suddenly wheeling, disappeared, with a swirl of the water that caused me to oscillate and swing about most uncomfortably. The incident gave me such a shock that it was some time before I again cared to descend. I was assured, however, that sharks are afraid of a man dressed in the certainly monstrous-looking costume of a diver, and subsequent experiences confirmed this assurance, so that by-and-by I felt no apprehension at the presence of sharks, and I have sometimes had as many as twenty in close proximity to me. On catching sight of me, these formidable animals invariably swam quickly away. Not only sharks, but all fishes and other marine creatures were afraid of my odd-looking figure, and always fled as soon as they perceived me. This, very often, was not until I was close to them. I clearly perceived, when beneath the waves, that there was something peculiar about the vision of fishes. Very few, if any of them, can see objects beneath them,

and their range of vision, in their own element, seems to be less than that of a man. I could see them some time, before they perceived me—at what distance it would not be safe to say, the difficulty of estimating the distance and even the size of objects beneath the water is so great, owing to refraction and apparent enlargement. It was a singular sight to see a fish, or perhaps a number of them, swimming calmly towards one, and on suddenly becoming aware of his presence, dashing down and away like a flash of light. I noticed that all fish seem to swim habitually in a slow and deliberate way, and only exert their powers of great speed and activity when they have some special object in view, as escape from an enemy, or pursuit of their prey. I also noticed that when surprised, and in danger as they thought, the first impulse of all species, sharks included, was to dive before darting away. Probably this action is intended to prevent a pursuer noting the actual line of flight.

The seemingly monstrous creatures which inhabit the submarine forests and grottoes of the reef are much calculated to try the nerves of an investigator, until he has become thoroughly used to the weird sights—sights which are the more spectre-like, in that they are unaccompanied by the least sound. The diver hears nothing, except perhaps the tap of his hammer or crow-bar, and that in a subdued tone, almost inaudible, so effectually is sound excluded by the water and his close-fitting head-piece. He soon perceives, however, that of all the monstrous-looking creatures that visit the weird depths, the natural inhabitants consider him the most fearful, for they all shun him. Even that horrible phantom of the deep, the octopus, flies the presence of the diver. On one occasion I saw one of those loathsome-looking creatures slip off a rock and sink into the black depths of a submarine cavity. It was out of sight almost before I clearly discerned it; but I can say with certainty that its bulk exceeded my own, with tentacles that I thought were five or six feet in length—a monstrous, bloated, spider-like creature, the sight of which made me thrill with horror.

Referring to spiders reminds me that there are at least five species of spider-crabs on the reef, the largest of which, with a body no larger than a cocoa-nut, has legs which will span a radius of seven feet. This is quite a distinct species from the large crab mentioned as haunting the Abrolhos reef. None of the five members of the *Oxyrhyncha* family referred to here seem to be figured in classified lists. One much resembles *Macropodia longirostris*, but with a shorter beak and more rounded body, and is, moreover, twice the size of that species. It may possibly be the larva of some other crustacean; and the same may be said of one other species.

It was found to be impossible to obtain a perfect specimen of the large crab mentioned above. The animal ensconced itself in the midst of intricately branched masses of coral, where it could not be reached by the hand; and if a leg was seized, it at once threw off the whole or part of the member, while the animal itself quickly sank into the depths beneath it.

Many hundred species of crustaceans live on and about the reef, most of which are very small. Crabs of the size of a sixpence, and of a purplish or violet colour, are very abundant. Others the size of a penny-piece are a bright yellow; and some species are noticeable for eccentricity of form. The singular enlargement of one claw or nipper, so frequently seen in the land crabs, is very prevalent amongst the Barrier Reef crustaceans. There is a species of shrimp or prawn on the outer face of the reef where the water is deep which has this peculiarity, and several of the crabs are noticeable for a like singularity.

Among the lower forms of animal life, nearly every family of insect and arachnida is imitated in shape by some species of crustacean; and on the reef may be found what may justly be termed ocean spiders, millipedes, scorpions, and creeping and crawling things innumerable, leaving a strong impression on the mind that every terrestrial animal has its counterpart in the ocean, however widely it differs in some one or more essential part. Evolution admitted, surely the crabs are highly specialised spiders

which have taken to a marine life. The limpets and sea-snails come still closer to terrestrial species of molluscs; and many of the lowest forms of ocean life seem to be derived from distantly related land animals of a similar class. This is very noticeable in some of the lower forms; though I am constrained to remark that there are many marine creatures which do not seem to have a parallel on dry land, especially in the higher, or vertebrate, classes. I cannot, however, enlarge on this curious subject here; but much remains to be said in favour of the theory that marine classes have been evolved from terrestrial classes.

The reef, of course, abounds with molluscs. So numerous are the species that I cannot attempt to cope with them within the bounds of a couple of paragraphs. The pearl oyster (*Meleagrina margaritifera*) is found in large or small numbers in many parts of the reef; but it is in the north and in Torres Strait that the greatest numbers are found. Should the supply of shells in those districts run short, probably a sufficient quantity of them would be found as far south as the reef extends, to make the fishery payable.

Gasteropod shells of the *Conus* family are found on some parts of the reef, one particularly fine one being of a bluish-grey colour, with very beautiful violet veinings. Probably some very rare and fine specimens could be procured here. Certain it is that I procured several which were hitherto unknown to our local collection, and were eagerly sought after by the colonial museums; and others I saw which seem to be without representative specimens in European collections. The spider-shells (*Pteroceras*) have several representatives on the reef, the most remarkable being one similar to the Swan River spider-shell, but double the size of that variety.

Of the numerous creatures of the lowest forms, numbering doubtless tens of thousands of species, which swarm on all parts of the Barrier to the lowest depth I have ventured to search, it is obvious I can give but the scantiest of notice. Apart from the fact that these creatures could not be adequately described except in technical terms,

which would be monotonous to the ordinary reader, no good idea of the animals could be given without the assistance of coloured plates.

The fishes on and about the reef are very numerous. Some are migratory, others are found at all seasons of the year, and many use the protection of the weed and coral forests during the breeding time. The fact that sharks attach their curious four-cornered, packet-like eggs to the coral branches has been already noticed; and it may now be added that the reef seems to be a favourite breeding-ground of all the sharks known on the Australian coasts, including the blue shark (*Carcharias glaucus*), the Port Jackson shark (*Cestracion philippi*), the common white shark, and two species of the *Crossorbinus* genus.

Albicores and bonitoes are very common on all parts of the reef, and perhaps the commonest of all the fishes frequenting this part of the east coast of the continent is the barracuda, which, growing to a length of about fifty inches, may be seen in shoals which rival those of the herring or mackerel for numbers and denseness.

Amongst the most curious fishes is one known to the local fishermen as the rasper. This is the common knife-jaw (*Hoplognathus conwayi*), a fish which seldom exceeds a foot in length, and is in shape somewhat tench-like. The jaws resemble a short beak, are very distinctly marked, and are knife-edged, with but a few sharp teeth. The fish has acquired its local name from its habit of rasping the coral, on the polyp of which it feeds. It also eats young shell-fish, and is particularly destructive to the young of the pearl oyster; yet the fish is not known about Torres Strait—or at least not well known. It seems to be most plentiful between latitudes 16° and 20° S., and is found in shoals of varying sizes. Sometimes about twenty fish were seen together, and occasionally as many as six hundred; but the fish do not keep very close together, and it is difficult to guess the exact number at a given spot. I have caught a few with hook and line, using a very small mussel with broken shell as a bait, but as a rule they are only captured in nets. They are excellent food,

There are two or three species of gurnards on the reef, all of which breed there, and there is also a sucker-fish, *Echoneis reinora* apparently, which attaches itself not only to the skin of sharks, but to that of a great number of other fish, as the bonito, rock-cod, and ling, and also to smooth rocks, where they are to be found.

Probably the smallest fish found on the reef is the remarkable dragon-fish (*Pegasus natans*), which is less than three inches long. When alive, it appears to be semi-transparent, lightish in colour, and spotted with minute black dots. The snout is elongated into a spatulate beak, and the eyes are placed on the top of the head, so that the creature is constantly looking upwards. It frequents shallow water, being but seldom found at a greater depth than six fathoms, and the use of the beak seems to be to stir up the sandy mud. It then watches for and captures the minute crustaceans, etc., which it has forced from their homes. It is very agile in its movements, and swims with great rapidity, and though very numerous, they never collect into compact shoals.

Another curious fish on the reef is found on the outer face only. It has the snout and mouth of a shark, with the flexible, elongated, but flattened body of an eel, and is five or six feet long. It appears to be a member of the *Notocanthidæ* or thorn-back family.

The common conger-eel (*Conger vulgaris*) is one of the most abundant fishes on certain parts of the reef, but there is nothing remarkable to be recorded of it. They average five feet in length, but specimens of six or seven feet are common, and the fishermen talk of occasional monsters of nine and ten feet. A creature of the same genus (a murœna, apparently) is much dreaded by the fishers, and with good cause, I think. One which was dragged aboard our boat, though less than five feet long, gave more trouble than the largest conger I have seen captured. It struggled and bit like a fierce dog, making a noise meanwhile something like the snarling of an angry cur. Congers also make a noise while being killed, and some large fish, on being dragged into the boat, give vent to a sound like a dull,

short bark; but whether this sound is articulate, or caused by the forcible passage of air through the gills, I cannot positively say. It seems that the animal has some control over the issue of the sound; at any rate, so it appeared to me.

I have seen several flights of flying-fish about the reef, but these curious fish are not common there. The species (*Exocœtus evolans*) is eminently a pelagic one, and is but seldom seen inshore on any part of the Australian coast.

There are a great number of seemingly coral-feeding fishes about the reef, most of them of small size, but occurring often in great numbers. One of these, remarkable for the abnormal development of its tail and fins, and still more so for its curiously doubled or aborted medial line, appears to be Bleeker's plesiops (*Plesiops bleekeri*).

Globe- or sun-fishes of enormous size are found on the outer side of the reef. They have been taken exceeding half a ton in weight, and one which I saw during one of my submarine rambles could not have been less than eight feet long, almost as many broad, and probably weighed more than double the above-named weight.

I cannot exhaust the list of fishes found on and about the reef. A few of the rarest and most curious have been briefly described. Amongst others that are more or less common, I have captured or seen species of goby, dory, ling, cod, gar-pike, coffer-fish, and, as I have before mentioned, there is scarcely a fish known on the Australian coasts that does not visit the reef at some season of the year, while the majority of species are permanent residents there. Even rare pelagic species often come into the deep water immediately outside the reef, and occasionally find their way through the opening into the shallow water fronting the coast, where they usually get bewildered and fall a prey to the ready fishermen. Whales used at one time to frequently meet with this fate; they have been so persecuted, however, that now they are seldom seen near the reef.

I cannot omit mention of the turtles, which still frequent the reef in considerable, but yearly dwindling

numbers. Formerly they swarmed in parts of the shallow water between the shore and the reef, and were found in great numbers through Torres Strait and in the Gulf of Carpentaria. No discretion, however, was shown in the numbers caught or the time of capture, with the inevitable result that there are now but units where formerly there were hundreds. Moreover, the animals have learned caution, and the sight or smell of a human being is sufficient to spread wild alarm through even the herds of turtle, who lose no time in hastening to safer dwelling-places. Many of their former most frequented haunts on the reef have been entirely abandoned, and there are quays on the reef where twenty or thirty years ago turtle might be found in tens of thousands where now not a single animal ever appears. As a few years ago these quays had not been discovered by the fishermen who resort to the reef from all parts of the east coast of the continent, and even from more distant spots, turtlers not infrequently coming from New Zealand, I shall not more precisely mention the locality of these last resorts (as they appear to be) of an animal that requires a long respite to recoup its numbers.

There are two species of turtle, the green (*Chelone Mydas*) and the hawksbill (*C. imbricata*), common on the reef; one, the loggerhead (*Thalassochelys caretta*), tolerably common, at certain times at any rate; and several species which seem to be very scarce. Of the latter, the leathery turtle (*Dermochelys coriacea*) is perhaps the scarcest. There is another turtle, about which no authority on the subject seems to know anything, and of which no example is to be found in the British (or any other European) Museum, but which is manifestly a connecting link between the green and the hawksbill species. Indeed, the turtle referred to partakes so remarkably of the characteristics of the two named species, that I am inclined to believe it is a hybrid between them. It grows to a large size (five hundred pounds at least), and is often almost as beautifully marked with deep red and yellow as the hawksbill itself. It is rare on the reef, but not so

much so as to make it very difficult to find. I have seen eight or nine specimens, and heard of quite as many more.

The leathery turtle is a very extraordinary creature, and is, I should think, the largest living turtle. I have never assisted at the destruction of one of these animals, but I have seen them so large that I think individuals must have weighed at least half a ton. Intelligent fishermen with whom I sailed, and who I feel confident would not exaggerate, assured me that one they captured and took into Port Curtis weighed more than fourteen hundred pounds.

The food of the leathery turtle, like that of the hawksbill, quite differs in character from that of the green turtle. It consists of fish, and particularly of molluscs and crustaceans. It can crush up with ease large bivalves, some of which weigh thirty or forty pounds; and huge crabs form no small item of its usual food. It seems, like the hawksbill, also to be a greedy feeder. I have seen the hawksbill seize and devour crabs which weighed sixteen or twenty pounds, and amongst the contents of the stomach of a leathery turtle which were showed to me, were the remains of a large spider-crab clearly discernible, mixed with a mass of molluscs, looking like huge cockles; and which were probably obtained at a depth of eighty or ninety fathoms on the outside of the reef.

Of the other kinds of turtle, it is only necessary to record that I have assisted at the capture of specimens of the green which weighed over five hundred pounds, and specimens of hawksbill have been taken in my presence which exceeded seven hundred pounds in weight. Both these species are in the habit of sleeping as they float on the surface of the water; and though they awake and dash off before a boat can get near them, they are not at all disturbed by half a dozen terns alighting on their backs; and I have often seen these birds and other sea-fowl resting on the backs of sleeping turtles.

As most of the Australian fishes are found on the reef, so are the greater part of Australian sea-birds. The

commonest species which I have noticed are terns, a gull, pelicans, and albatrosses. The latter are very frequently seen hovering over the reef, and seem to find an abundance of favourite food, judging from the frequency with which they descend to the surface of the water. The pelicans breed in great numbers on certain of the quays and shoals. There is a low sand-bank south of the Black Rocks, off Weymouth Bay, where these birds breed in thousands. The bank is so low and so small in extent, that it seems impossible that it is not swept by the waves in bad weather; yet the birds seem to safely rear their young there and on several similar quays that I know of, some of which do not seem to rise more than one or two feet above high-water. I can only conjecture that the unerring instinct of the birds guides them better than the human eyes could do, to the safest breeding places. That they do not suffer any material losses is satisfactorily proved by the immense numbers of them that harbour about most of the rocks and dry places of the reef. Fortunately for them, pelicans are not wanted by the human hunter; they are in use neither as ornaments nor food; and until some seeker after a new source of wealth finds a market for them, they may hope to inhabit undisturbed the barren sand-banks, which seem to meet all their humble requirements for a dwelling-place.

CHAPTER XXII

FOSSIL REMAINS ON THE AUSTRALIAN CONTINENT

My remarks on the fossils of Australia cannot exceed a scanty sketch in extent; in fact, it is not my intention to make any general observations on the subject, or attempt to deduce any final conclusions. I must confine myself to a partial description of the few remarkable specimens which I have at odd times found during my rambles, some of which were of species hitherto unknown, and several of which are now in the public collections of the Australian colonies, or in those of private persons who obtained them from me.

Australia is usually described as the headquarters of the marsupial class of animals, and justly so; yet, as I have already remarked, I think the fact that there are in the country several mammals of placental type which are undoubtedly of great antiquity is too frequently lost sight of. I have not yet seen any satisfactory proof that the Australian continent was the *first home* of the marsupials, far less am I satisfied that the Australian types of the class were derived from America, or the American from Australia. It seems to be more likely that the marsupials of both continents were derived from some now submerged land of vast area, of which the multitudinous islands of Polynesia are remaining points. Quite possibly the southern lands (the true Australia) of the Antarctic regions were at one time joined to our continent; and before accepting any theory of the origin of the marsupialia, I want more light on the geology of Polynesia, and of the great south land. The latter is as

yet an unexplored region; but I am surprised that more work has not been done in the vast Pacific region. The information we have of the Polynesian islands, even the larger ones, is not sufficiently copious to be of much real use to the evolutionist; and there is New Guinea, too, and the large islands of the Indian Ocean. These are scarcely tapped sources of information, which I expect by-and-by, when they have been thoroughly searched by really competent men, will prove to be a rich mine of intelligence concerning the origin and distribution of the marsupialia. Islands are peculiarly valuable sources of information on such subjects as the origin, survival, and migration of animated groups, as is evidenced by New Guinea, Celebes, Borneo, Timor, Madagascar, and our own island-continent of Australia. Nor are even very small islands wanting in rich information on the same subjects. I need not go so far afield as the Galapagos and some of the small islands of Africa to illustrate this fact. Many of the mere islets which surround the Australian continent have their peculiar species, as Depuch, Abrolhos, and Barrow islands, and many others which do not contain twenty square miles of surface. Until these islands, large and small, are better known, I think it would be futile, if not actually presumptuous, to attempt to show that Australia is, or is not, the natural home of the order which without doubt at the present day reigns supreme there. All that I can do, therefore—all I am justified in attempting to do—is to add my mite to the information which is slowly accumulating, and which will in good time, I firmly believe, enable us to trace the most curious and interesting of modern groups of mammals to the true basis whence they sprang.

Ancient human remains are very scarce on the Australian continent. There is no evidence that the land was ever inhabited by any race much dissimilar in make and habit to that which now roams its deserts and which is fast travelling to the bourn whence neither race nor individual ever returns. Admitting (which, however, I do not) that there are two races of aborigines on the

continent, the question arises: "Is the one race the descendants of invaders? and if so, is the other race the true aboriginal people of the land?" There is no direct evidence bearing on this question.

The northern division of Australian aborigines, which is much the finest from all points of view, is the one which is said to be of Malay origin. My belief is that there is a considerable quantity of Malay blood mixed with the native blood in all parts of the continent, but no doubt it predominates in the north. The Malay, however, is not the original stock in any one part of the land, but may possibly be derived from the *Malay ancestor* in all parts of it. That is my view, but I do not insist upon it in a spirit of dogmatism.

Of the actual age of man in Australia we have, so far as I have been able to learn, but superficial deposits to guide us, and those are few in number, and poor in quality. I have found skulls in fluvial deposits, generally when digging wells in the beds of rivers, which seem to point to a smaller race of men inhabiting the country in bygone days, but not differing in shape from those of the present race; and as to size, that is very elastic among the aborigines to this hour, and depends entirely on local circumstances. Often in barren districts, where game is scarce, we meet with full-grown men who are not bigger than ordinary fourteen-year-old boys. Size, therefore, in an abnormal land, is not evidence of variety of race. In South Australia, however, not far from Castlemaine, and again in the bed of the river Lodden, I came upon the remains of men of fine build, approximating to those of the north at the present time. These consisted of several skulls from the country west of Castlemaine, and skulls, bones, and three complete skeletons from the bed of the Lodden. All these were of normal type, and found in the north would at once have been taken for the remains of men of the present race. Nowhere have I found the bones of men intermingled with those of animals of extinct species, or in the same deposits, nor have I ever discovered the slightest trace of a race acquainted with the arts of

civilised man. What the savage is at the present day he seems to have been six or seven thousand years since, and this is about the period at which I should put his existence in the land. There is no direct evidence to show that it is older than this; but there is one puzzling circumstance which I cannot explain: I have always considered that the dingo-dog has been introduced by man, but traces of the dog's existence are much older than those of man. Of course the dog may have been introduced by casual visitors before the land was inhabited, though this is scarcely likely. Again, the dog may have been introduced by other than human agency. This is unlikely, but still possible.

My chief reason for believing that the dingo was introduced is the fact that the animal appears suddenly in pretertiary times, and yet it stands alone. No possible ancestors from which it might have sprung have been discovered in Australia, and there were never any other animals of the genus on the continent. There was a species of thylacine; but though this animal is to some extent dog-like, it is certainly not in any way related to the dingo, but is clearly descended from a marsupial. It is worth noting that thylacine and dingo in New South Wales are of about the same geological age. The thylacine has not been found by me in northern or western deposits, but remains of the dingo are spread all over the continent.

In the secluded valleys of the Blue Mountains, and on the plains to the eastward, which, being those nearest my early home, were first examined by me, the remains of small marsupials are very abundant, and in this district I discovered several new species, most of them prior to the year 1875. Amongst others from this region, I found two or three species of rat which were not marsupials. As these were of pretertiary age, it is conclusive proof that the prehistoric mammals of this continent were not all marsupials.

In the bed of a stream in the Swan River district, Western Australia, I found part of a skeleton of a rat which was at least double the size of the modern water-rat

(*Hydromys chrysogaster*); that is, the animal when living could not have been much less than six feet in total length. This monstrous rat was clearly not a marsupial. The bones were in so fragile a state that they had to be handled with great caution to prevent complete destruction. Found in the damp sand of a dry river-bed, they had probably been washed up from some much older deposit.

The remains of animals of the kangaroo genus are the most abundant in nearly all parts of Australia, and here the evolutionist can certainly create a complete chain of evidence in support of his theory. Indeed, I am surprised that Australia is so much neglected by the speculative geologist, for not only can a complete series of kangaroos be established there, but another also, of smaller marsupials—those of the opossum genus—might, I think, be easily put together, to say nothing of many minor bits of interesting evidence of great use in a general way.

Both kangaroos and opossums were formerly of gigantic size; but a few of the latter were smaller than any existing species, and it is puzzling to find all the marsupials of the two named classes existing in great variety of size apparently at the same moment. It would be more convincing if the evolutionist could point to a successive series of ascending or descending types; but that, I am afraid, he could not do in Australia. An opossum that weighed perhaps forty pounds, and another that weighed no more than an ounce once undoubtedly lived side by side in the dense forests of some of the Blue Mountain and Queensland valleys; while it is probable that the giant kangaroo weighed more than a ton, and fed on a plain that swarmed with wallabies that did not exceed a squirrel in size. There must have been a surprising state of things on the earth, and in Australia in particular, before the dawn of the modern age. In the latter country there was no beast of prey capable of attacking the larger marsupials, nor, indeed, of affecting the balance of species in any way; and how that balance was maintained it is most puzzling to conceive. That

dingoes were formerly (in pliocene times, for instance) exceedingly abundant is shown by the abundance of their remains; but even in this present day a pack of dingoes is no match for an "old man" only a tenth the size of his progenitor of the tertiary age. The strength of such an animal as *Macropus titan* must have been prodigious, and if a latter-day "old man" can slash down dingo after dingo with his powerful sharp-clawed hind leg, it is evident that the ancestral titan could with ease sweep away hundreds of them; but the dingo knows better than to attack an "old man." No number gives him courage to attempt so mad and suicidal a task. Even other large kangaroos are more than a match for the dingo.

Kangaroos and wallabies must therefore have increased at an enormous rate: and did so increase, as their numerous remains testify; and as I could never discover that the land was formerly richer in vegetation than it was at the time of its discovery, I am lost in wonder that it was capable of supporting such vast herds of animals. The modern colonist is worried about the quantity of grass the kangaroos consume, and is at vast expense in erecting fences by the hundred-mile length to keep them away from his pastures. What would he say had he hundreds to contend with where he now has but units? and each individual of those hundreds ten times the size of modern kinds, and presumably requiring ten times the amount of food!

Kangaroos were present in Australia on the North Darling plains, in many places in the interior of Queensland, and in portions of northern South Australia as early as the beginning of the eocene age. That much I can assert from actual observation; but on Fitzroy Downs, on the upper Dawson River, I found the skeleton of a kangaroo while boring for a well which seemed to be in even older strata. It is not always easy, however, to be sure of the age of Australian strata. The depth at which the bones lay was thirty-two feet, in ground which consisted of a kind of limestone, with very thin superficial deposits.

This kangaroo must have stood about eight feet high; it was therefore very much larger, and perhaps double the weight of the largest existing species. This, of course, is not a remarkable size compared with other great extinct kangaroos, but it is worthy of note, as it was undoubtedly one of the oldest specimens yet discovered on the continent.

Kangaroos, however, were not the largest animals that formerly roamed the wide plains of Australia. On the Darling Downs I found, at a depth of twenty feet and in superficial deposit, the greatest part of the skeleton, including all but a few bones of the skull, of a gigantic animal recognised by the curator of Sydney Museum, as *diprotodon australis*. This monstrous creature has been described by Huxley as "a kangaroo-like animal"; but it differs greatly in many respects from the modern group of kangaroos. It may have been a true marsupial, though of that I have some doubt; but the proportions of its limbs, and its exceedingly massive build generally, show at once that in habits as well as in form it was a very different creature to the kangaroo of our day. It certainly must have had a different way of locomotion to that of the modern members of the genus, as the limbs were not at all adapted to hopping, and the animal must have weighed from fifteen to twenty tons: that is, it was very much larger than any existing animal.

There are remains of several other giant animals to be found in all the colonies of our continent, some of which were far more kangaroo-like than the diprotodon. Complete skeletons of any of these I have not been so fortunate as to find; but skulls, or parts of skulls, and odd bones found in the north-west near the rivers Murchison and Gascoyne, and in the Port Darwin district, convinced me that there were formerly, and quite as recently as the pliocene period, true kangaroos which probably stood nine or ten feet high, and weighed, approximately, six tons or more. Anybody who has heard the heavy thumping of even small species of kangaroos as they hop about during the stillness of night, will be able to form some notion of

the terrific shaking the ground must have sustained while a herd of these giants were bounding over it.

Other well-known species of Australian extinct mammals have been found by me as follows: *Nototherium inerme*, in all deposits as low down as the eocene, and in many New South Wales and Victorian districts. But I have not found traces of this species anywhere in the northern parts of the continent. *Macropus titan*, *M. Goliah*, and *M. atlas* seem to have been almost universally distributed on the continent, and their remains are found as low down as the middle eocene. All classes of existing marsupials were represented in tertiary times, including the rat-kangaroos, and all classes had then gigantic representatives. A "native cat" (*Dasyurus laviarius*) was a much larger animal than the present bearer of that misplaced name; but I found on the Gascoyne the jaw-bone, with part of the teeth, of an animal of this kind, which must have been as large as a leopard. It is just possible that this huge *dasyurus* may have been a formidable beast of prey; but the probable, though conjectural, evidence is against that conclusion.

Mice, probably of the genus *Sminthopsis*, are mostly found in superficial deposits, though I have found traces of them as low as the pliocene. They are generally from a third to a half larger than present species, though one, from the late pliocene of New South Wales, seems to be identical with *Sminthopsis murina*.

In size and general structure, *Thylacynus speleus*, the continental extinct thylacine, differed but little from its surviving Tasmanian relative. It clearly was not a true marsupial, and it would be most interesting to trace its ancestor. I have quite failed to do that; and the remains of the indicated species have not been found by me in earlier deposits than the late pliocene.

I believe the above notes carry the age of several Australian genera of mammals to an earlier age than has hitherto been assigned to them. I have hope, therefore, that they will be of some small interest to scientific naturalists.

Of birds I have scarcely found any traces except in superficial deposits, and the number of extinct genera that have come under my notice has been exceedingly small. The lyre-birds and the brush-turkeys are two of the oldest forms on the continent, but they are followed closely by the cockatoos and other parrots.

The oldest bird, however, that has been discovered in Australia, so far as I can learn, is a species of emu, the *dromorius*, which was about twice the size of the existing emu, though there seem to have been at least three species of this family, which varied in size. Their remains have been found as early as the late miocene, but there is some evidence that one large species at least survived to historical times. I have found the bones of this bird, in some cases nearly the entire skeleton, in the same deposits in which human remains were tolerably abundant; and that in Australia is a very late period. There is no trace of man in Australia earlier than his remains in a vegetable mould or detritus of a very recent date. Roughly, I should place six or seven thousand years as the extreme limit of the period he has inhabited the land.

To show how generally species in the early ages of the earth's existence exceeded in size their descendants, I may record that there was a lizard in miocene times which was fourteen or fifteen feet long and of the girth of a tolerably large bullock. The remains of this huge reptile, which was closely allied to the water-monitor (*Varanus salvator*), have been found in the Port Darwin and the Port Denison districts, but little or nothing is as yet known to European scientists concerning it. In fact, there is yet much to be learned by the naturalist concerning our great continent; and I have found so much ignorance, even among native naturalists, of the past condition of this noble country, that I am convinced that a specially organised expedition for the discovery and classification of Australian geological specimens is much needed, and would result in the establishing of many interesting points that every evolutionist must hold of great importance to his peculiar doctrine.

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